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Women's subjective experience of the ultrasound examination during pregnancy

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This thesis is submitted in part fulfilment of a Master of Health Sciences at the University of Otago, Dunedin, New Zealand.

October 1997
Abstract

Virtually all pregnant women in New Zealand undergo an ultrasound examination during pregnancy. Previous studies have been conducted to find out how women feel about the ultrasound examination, however, these studies were carried out in specialist centres with adequate equipment and plenty of skilled staff. It is not known what happens to women and their families in busy hospital clinics or private facilities. This study has focussed on the ethical issues surrounding the use of ultrasound technology and the identification of any ethical issues raised by the women. By conducting this study I have a greater understanding of how much women appreciate ultrasound examinations. However, the study shows that we need quality standards so that all women in the region can benefit equally. Based on the findings of this study, there is evidently a discrepancy between theory and reality. Health professionals fell short in their obligation to respect the woman and to promote her autonomy as a patient, and failed sometimes, to provide a quality service.

This study was carried out using semi-structured interviews. Altogether forty one women took part and were interviewed after the ultrasound examination. The survey included closed questions about the presence of any health disorders, or complications arising from this or previous pregnancies. The survey also had open ended questions which collected more descriptive information. Quotes from the study participants are included in the discussion and serve to clarify and support the quantitative data. The data was analysed using qualitative and quantitative methods. This multiple approach to data collection and analysis in a single study has been referred to as triangulation. The questions were divided into six topics of interest; the reason or indication for the ultrasound examination; the nature of any costs or resource implications; the process of informed consent; the women’s experience of the examination and what particular aspects they enjoyed; the possible issues of fetal or maternal rights; the influence of this technology upon women.
The results show that half of the women in this study had no clinical indication for the examination. Motivation for attending for an ultrasound was in the belief that it was appropriate health care and also a strong personal desire to find out more about the baby. The cost of ultrasound examination may be quite high in that it was found that routine examinations were frequently repeated. Women were not well informed about the purpose of the examination or prepared for possible adverse outcomes. The level of benefit gained by the women from the ultrasound examination varied. Those undergoing endo or transvaginal ultrasound examinations however found this technique to be humiliating and unpleasant. The ultrasound examination can provide potentially threatening information about the fetus. This is because termination of the pregnancy is the 'treatment' most often suggested. The control gained from this medical technology was felt by the women to have more benefits for the health professionals than for themselves, although women valued the information as information about the baby just for its own sake. The predominant response by women to the examination was that it enhanced their personal knowledge of the baby. They felt an increased sense of attachment, and a strengthened need to protect and relate to the baby.

The results of this study will be available for the women who participated, health professionals, and service providers. This research may help bridge the gap which currently exists in this area between women's subjective experience of technology, and the more objective attitudes as reported in the medical literature. The question of a clinically indicated ultrasound done well is not in question. The question of whether it is worth doing routinely involves values. At this level, elected representatives, the legal profession, patients advocates, or even better, women themselves should have a say. The Treaty of Waitangi establishes partnership as the foundation of social and political relationships in New Zealand. For this reason, if no other, experiences such as those described by women in this study should be recognised as valid evidence to be included in any debate about ultrasound services.
I would like to thank the following people who contributed to the accomplishment of this thesis.

Rod, James and Ruth Oakley for giving me the space to study and their unfailing support.

My supervisor, Professor Grant Gillett for his help and advice, I could not have completed this work without his encouragement and enthusiasm.

Sheila Williams, who gave advice on what questions to ask and how best to ask them, and who later helped me with the statistical analysis and writing of the report.

The fortyone women who consented to being interviewed, without whom I would have no study.

Finally, I want to thank Catherine. Catherine recalled her first ultrasound thus,

"I was asked to attend for a scan when I was 24 weeks pregnant. When I asked why, I was told the machine was there and we should make use of it. I never had scans with any of my previous pregnancies".
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We should be on our guard not to overestimate science and scientific methods when it is a question of human problems; and we should not assume that experts are the only ones who have a right to express themselves on questions affecting the organisation of society.

Albert Einstein
Introduction

This study was designed to investigate women's subjective experiences of ultrasound scanning during pregnancy. Altogether, a total of forty-one women took part. The survey included both open and closed questions as part of a semi-structured interview. The results were then analysed using both the qualitative and quantitative data. This method of research allowed all of the women's voices to come through strongly in the analysis. The goal of the qualitative research was to establish the woman's own picture as it fitted her, while that of the quantitative was to measure the degree to which experiences were common to the whole group.

When I began this study, I was interested in investigating a voice or standpoint which did not appear to be represented in the bioethics literature. The subjective experience of ultrasound examination during pregnancy as described by the women is the main focus of the research study. Of major interest was how this aspect of antenatal care fits in with the basic rights of informed consent: did it enhance the woman's decision-making process; also did the ultrasound examination ever raise issues of fetal rights, and if so, how would this affect women? Finally, do health professionals who might be presumed to be aware of limited health care resources, assist women to be more effective users of this particular resource.

The reasons for my choice of topic

The major reasons for my choice of topic are embedded in my personal work history. This has been predominantly as a midwife for nearly thirty years. My professional career involved contact with women and families in their own homes and in various hospitals. Over the years there has been an increasing use of new technologies during pregnancy, labour, and birth. With the arrival of these newer technologies I have felt some sense of loss: loss of what is old and past, eroded by newer customs more appropriate for this age. I do not discount the valuable contribution to women's health that these newer technologies have brought. I would
like only to learn in what way a woman's experience of pregnancy has been affected and enhanced by the availability of this particular technology.

In my early midwifery days it was women themselves who were the main authority on the well being of the baby. Women told us how active the baby was and how they felt baby was growing. Women intuitively knew when things were not progressing normally, although they did not necessarily know the cause or the medical terminology. As a student midwife I recall a woman explaining to me that in spite of her abdomen getting very big, baby had stopped moving. She was fearful that something was wrong and had brought her mother along to the clinic for support. Midwifery diagnosis: Polyhydramnios with fetal death. Midwives were able only to share with women the responsibility for measuring the health and progress of their pregnancy. Now, in the nineties, it is apparent that with ultrasound examinations we tend to take less notice of information provided to us by women. I would stress that this is not an anti technology thesis, technology is not a problem as the technology of ultrasound is intrinsically neither good nor bad. It is how it is used that determines the potential for benefit or for harm. Additionally, during the past few years I have been engaged in the study of bioethics. This study examines issues about informed consent, for ultrasound examinations. From this I will be able to document a part of health care that has not been given sufficient attention by other ethicists.

Learning to understand medical technology is a well known problem. When the office of Technology Assessment conducted a survey in 1987, it revealed that a substantial proportion of the population feels powerless in the face of medical scientific knowledge (Rosser, 1994). I was interested to find out if women experienced similar problems with understanding the ultrasound examination. I also wanted to learn if this technology interfered in any way with their own understanding of pregnancy. In 1986 the book *Women's Ways Of Knowing* was published. This work suggests that women, especially, fear questioning anything they know that is scientific.

In general this resulted in *silence*, a position in which women experience themselves as mindless and voiceless, women find the jargon of scientific
medicine somewhat intimidating. Subject to the whims of external scientific authority (Belenky et al. 1986, p.15).

I first considered exploring the area of ultrasound when I was caring for a woman who was expecting her third child. Even though she had experienced the examinations before, she asked many questions, questions such as, "Was it accurate? Was it safe? Could you rely on the results?" It seemed to me that she was not as well informed about the ultrasound examinations as I would have expected her to be. This made me think about the principle of informed consent. Was it an important principle in relation to what had, after all, become a fairly routine diagnostic procedure? From my own work experience I knew the process of informed consent was not formally sought for ultrasound examination. Women did not have written information explaining the procedure or what the results might mean. Neither did they sign a consent form. However, I saw that the majority of women looked forward to, and greatly enjoyed the examination. Plenty of books which are available and pertain to pregnancy and childbirth contain some information about ultrasound. Under the circumstances, and because of these last two points I did wonder if this lack of formal informed consent really mattered.

My observation, of most women enjoying the ultrasound examination is in keeping with a large Australian study Brown et al. (1994). Over 70% of women in this study listed a scan as "one of the best aspects of care during pregnancy" Brown et al. (1994 p.84). Women reported that the scan was better than the other check ups as it showed that the baby was "okay". I wondered again if what was happening was something I should be particularly concerned about. Renfrew (1989) however has said that the questions that women have about maternity care should influence the questions that midwife researchers investigate. The subjective relationship between women and ultrasound technology was an area of research that I had not seen investigated. Therefore, if it were to be done, an experienced midwife with an interest in ethical issues would be the ideal person.
The aim of the study was to ask the women why the examination was needed and what they liked or considered special about the scan. I also needed to find out if I was correct in my assumptions about a general lack of informed consent and if something as ordinary as a scan could be a topic worthy of ethical debate. Part of my concern stems from the fact that, historically, the medical view has been the commonly accepted view of what has been worthy of debate, particularly the newer diagnostic technologies such as amniocentesis and chorionic villi sampling claiming the bioethical "limelight". But what is at stake in ultrasound scanning, from a woman's point of view?

Opoku, (1989) believes that research is linked with everything we do in midwifery practice: education, management and supervision; that we cannot do any of these things well, if we do not have knowledge about what we are doing. Midwives are educated to assist women to make informed decisions. They are particularly involved in providing information to women about the appropriate use of all medical technology during pregnancy. Walshe (1995), Opoku, (1989) and Renfrew, (1989) argue that ethics is relevant to midwifery practice and all midwifery practice must be based on ethical research. Walshe has said,

It is time to move away from decisions based on opinion, past practice, and - precedent towards making more use of science, research, and evidence to guide decision-making (1995, pp.28-29).

It is my opinion that ethical debate should also help to inform good clinical decision making.
Effective care in pregnancy.

Opinions differ as to whether all pregnant women should have an ultrasound examination as part of their antenatal care.

Care during pregnancy and childbirth should be effective. While no one is likely to disagree with this principle, marked disagreement exists as to what constitutes effective care. The disagreement arises from differences of opinion both about the objectives of care, and about the best means of achieving them. These differences of opinion are manifested in dramatic variations in the patterns of care from country to country, from community to community, from institution to institution, and from one care-giver to another. Enkin et al. (1991, p.1).

Antenatal care was and still is culture-bound and historically specific. In the very broadest sense the purpose of antenatal care has been for a healthy woman to give birth to a healthy baby. The manner in which this has been attempted has slowly changed over time. Shorter (1991,p.49), points out that "women used to take precautions against a whole armada of threats from the dark supernatural forces which, most of our ancestors believed, hovered constantly at the threshold". A much more direct form of intervention in pregnancy came from the practice of bleeding, or 'venesection' as it is known medically. One Viennese doctor has recorded that he bled women who demanded it, at least three times in every pregnancy, a practice which was continued even until the 1860s.

"Routine ante-natal care has never been shown to have a positive effect on outcome of pregnancy" (Rakusen and Davidson, 1982, p.123). It is only now, that the results of maternal stress on the unborn child is being recognised as a direct result of some forms of ante-natal care. We know that pregnancy has always been subject to
custom, community regulation and expert advice. This in turn, has reduced the scope and choice open to an individual women. In 'For Her Own Good: 150 Years of the Experts' Advice to Women, the authors carefully examine the nature of advice given to women by professional experts (Ehrenreich & English, 1978). These authors concluded that the advice of professional experts has been most damaging to women. Professional experts defined women as sick because they had a uterus and ovaries and then they set out to reinforce that sickness by exploiting women. The medical treatments they dispensed actually induced illness and kept them physically and psychologically weaker.

In New Zealand not everyone believed that all forms of antenatal care would be good for women. Papakura in her study examining the customs of the Te Arawa tribe found that before the full effects of colonisation, Maori woman, lived a natural and normal life right up until a few days before delivery, and avoided the painful experiences of the European women, (1986, p.113).

Advice that women have received from experts has continued to be conflicting and changing. Women have been told to have routine xrays of the chest, and had to undergo enemas and pubic shaving when in labour. None of these practices are continuing today because later experts found no evidence for their support. Fortunately some things have changed and improved. For instance as society's knowledge of nutrition and hygiene increased, pregnant women were encouraged to adjust their diet and to build up their health, which in turn benefited the infant (Tew, 1992).

At the turn of this century, in western society, antenatal care of pregnant women came much more under the control of medicine, because of advances in the understanding of human biology. This came about as a result of the increasing
development of science being incorporated into the discipline of medicine. The doctor using the newest approaches, monitored the woman throughout her pregnancy. The aim was to detect, minimise or prevent conditions (in pregnancy) which could endanger a safe outcome for mother and infant. One of the new scientific discoveries which was incorporated into medicine was x-rays. The existence of a fetus whose skeleton could be visualised with x-rays was demonstrated by the 1920's (Oakley 1984). Antenatal radiography came to be used frequently by doctors, whose patients could afford it, in the mistaken confidence that the fetus would suffer no harm as a result. Exposure to diagnostic x-rays in utero causes about a two-to-three fold increase in the risk of childhood leukemia.

**Ultrasound is incorporated into pregnancy care.**

Diagnostic ultrasound has been one of the great medical advances in recent decades. The use of ultrasonography has allowed obstetricians to expand their research potential; and to understand human embryonic and fetal development and maldevelopment. However ultrasound has not remained confined to the clinical care of particular at risk obstetric patients, but is now widely used as a normal part of antenatal care. Parallel with this spread of routine use have been some strong criticisms. A paper by Thacker (1985, p.437) assessing four studies of routine scans, found that overall scans were of little clinical use and described it as, "the premature use of technology". He recommended that as well as assessing scans for their efficiency, issues of cost, safety and acceptability also needed to be investigated. Unfortunately the idea of using ultrasound as a valuable contribution to pregnancy care seems an easy one to challenge through the literature, but so much harder to stop in practice.

The introduction of ultrasound to hospital practice by Donald in 1958 (quoted in Oakley, 1984), and other obstetricians and gynaecologists brought many clinical benefits to women. The successful investigation of abdominal masses by pulsed ultrasound to differentiate between benign cysts and cancer was something that had
not been done before. The application of ultrasound to obstetrical departments followed from the more general use of the equipment.

Soon after ultrasound apparatus was then acquired for Rottenrow, and while doing his antenatal ward rounds on Friday mornings, Donald was puzzled when his staff nurse, Marjorie Mar always seemed to know which way up the fetuses were. It turned out that she had developed the habit of using the portable ultrasound apparatus in order to determine the presentation of the fetus. Once Donald realised how easy it was to get a picture of the fetal skull he had the idea of measuring fetal growth with the aim of plotting fetal development. (Oakley, 1984, pp.159-161).

Understandably, enthusiasm for ultrasound as the first real safe window to the womb, continued. Further development was sometimes methodical and sometimes by accident. By the mid 1960's Donald and his team could identify a pregnancy at the time of conception by detecting a very early gestation sac. They could attempt to plot a normal growth curve for fetal growth and could also study the placenta. By 1978 ultrasound was held as being a safe non-invasive method of fetal evaluation. "the optimum number of scans in a normal pregnancy was set at, at least five" (Law, 1980, p.127 quoted in Oakley, 1984, p.165). In Great Britain ultrasound was now no longer a restricted diagnostic test but an integral part of recommended routine antenatal care.

The development of scans in New Zealand has been traced to Stewart in 1973 working at National Women's Hospital (NWH), Auckland, although by the eighties not all doctors were agreeing with scans as a matter of course. Dr Florence Fraser, an obstetrician specialising in ultrasound at NWH said, "it cuts out the use of brains, hands and clinical skills and reduces patient contact" (Auckland Star, 14.6.80) cited by Donley 1990). Stewart is reported to have said that even if several scans were done, this does not guarantee a healthy baby. However by 1982 Professor Bonham (NWH) was recommending "routine echogram at 16 weeks". This decision, and his influence, was reflected in the Public Health Commission handbook for pregnant women entitled
"scans are used to find out the position of the baby and of the placenta... Most mothers find that they enjoy seeing the baby and having the test done".

The trouble with this approach is that it has separated out baby from its environment, the mother, in that less account is paid to what is happening to the mother or what she may be trying to tell the professionals who care for her.

**Ultrasound physics**

Diagnostic ultrasound is a sophisticated electronic technology. Ultrasound medical imaging, or sonography, utilises pulses of high frequency sound which is propagated through the body tissue. Sound is a form of kinetic energy that is rapidly propagated away from a source through any mass containing substance. Ultrasound imaging is reliant on the piezoelectric properties of crystals housed in a transducer which is moved across the area to be examined. Microsecond pulses of ultrasound are emitted by the transducer and propagate through the tissues. As the sound passes through differing densities of tissue some will be reflected back to the transducer. The transducer has the ability to receive these returning echoes and convert them into electric signals. These signals are then processed by powerful computers so that each returning echo can be displayed in both its strength and position on a display screen.

Alternating high-and-low pressure phases are graphically displayed as waveforms that are defined as cycles of sound. The frequency of sound is described by the number of complete cycles per second, (cps) where 1 cps =1 Hz. Ultrasound has a frequency well above 20,000cps. One million cps is called a megahertz (MHz). To make a sonagram (sound "pictures"), ultrasound waves are transmitted from a wand-like probe called a transducer, which is passed back and forth in contact with the skin over target areas. The ultrasound waves bounce back to the transducer. Obstetric
ultrasound transducers use frequencies in the range of 2.5 to 7.5 MHz. The transducer can be abdominal, labial or vaginal.

As the transducer frequency increases, the resolution of the image improves, and the depth of penetration of the sound decreases. For example, scanning a slender woman in the first twenty-four weeks of pregnancy with a transducer of 5.0-MHz would give a good fetal image and a depth of penetration of about 7 to 9 cm. A larger woman later in pregnancy would require a transducer of lower frequency. The sound waves generate distinctive echoes, a computer translates the timing and strength of these echoes into an image of the tissue targeted by the ultrasound beam. Other equipment converts the echoes electronically into a picture on a television screen where they can be monitored, recorded on videotape, or photographed.

Endovaginal probes are especially designed for use inside the vagina. They are very suitable for first trimester examinations, infertility investigations, and in all age groups of women to assess pelvic organs. They have been in use for about 7-10 years and are used very extensively now. Endovaginal transducers are usually in the range of 5.0 or 7.5 MHz, allowing excellent resolution. Depth of penetration is less of an issue because the transducer is placed so close to the uterus and fetus. Endovaginal scans are the approach of choice during the first trimester, where precise very early dating or degree of development or viability is required. Heart, pulse and fetal pulse can be identified two weeks earlier using endovaginal scan as compared to transabdominal scan. Translabial scans are excellent for assessing the cervix and position of a placenta. They are also used effectively to take head measurements and examine the fetal brain if babies head is very deep in the maternal pelvis.

Ultrasound can provide fine structural details, to within 1 mm. They can show the size and shape of an organ. They can also provide instant displays of moving structures and can offer other information on the function of a particular organ. They can, for instance distinguish between cysts and tumours because a fluid filled cyst has a "sound signature" different from than the solid mass of a tumour. Ultrasound can
very clearly image the brain, lungs and bone of a fetus. Obesity or large scarred areas can pose obstacles to effective ultrasound imaging. A pelvic examination by ultrasound requires that the woman maintain a full bladder while the uterus is imaged. The woman must lie on her back on the examination table for the duration of the procedure. A gel is put on the woman's skin where the transducer makes contact, thus improving the penetration of ultrasound waves.

Concern about excessive use of ultrasound was expressed in the early 1980's, as a result of the findings of a scientific group meeting of the World Health Organisation (WHO, September 1984). Although it must be acknowledged that thirteen years is a very long time ago when talking about modern technology, some of the points may remain valid. The WHO report did not support the routine use of ultrasound in obstetrics because of a lack of adequate data on risk assessment. However it did stress that ultrasound should not be withheld on grounds of safety whenever there was a clinical need for its use.

The simplicity, the relatively low cost, and the apparent lack of hazards of ultrasound investigations have led to their overuse in the examination of pregnant women in industrialised countries. This overuse has had important consequences not only because of the escalating costs that have resulted from unnecessary diagnostic investigations (WHO, 1984).
Bio-effect mechanisms

There are two mechanisms by which ultrasound has been shown to produce biological effects, they are heating and cavitation. Whenever ultrasonic energy propagates through biological tissues, part of its energy is converted to heat. Cavitation is the development of bubbles (cavities) in a medium exposed to ultrasound. As waves of positive and negative pressure within the ultrasound field pass a bubble, they cause the bubble to expand and contract. These cavitation events produce mechanical forces in their vicinity, which may be sufficient to disorganise biological materials. For heating to damage human embryonic tissue the temperature in the area need only be raised by 2 degrees c, but this takes continuous wave over a long, static "dwell" time. All the heating and cavitation experiments have only produced these effects using continuous wave with long "dwell" time and high power output.

Diagnostic ultrasound is pulsed wave, the transducer emits a pulse lasting a millionth of a second then listens for returning echoes. Over a twenty minute scan sound is only actually being propagated for three minutes. All modern diagnostic machines have permanent power settings so that the safe limits cannot be exceeded. The latest doppler machines (spectral analysis) can require very high power. For this reason it is never used in early pregnancy and only on the umbilical cord in the third trimester. To safeguard this even further all machines at the public hospital have an "obstetrics" set-up, which is used in all pregnancy examinations. In this setting, the machine has a "cut-off" level for doppler power set at well below the danger level. "Dwell" time is another factor in heating which staff are constantly aware of. In diagnostic imaging operators always move the probe and never reach, or get near the danger time.

Doppler ultrasound, put simply, is the term given to "hear" fetal heartbeats. It is a form of ultrasound used to identify and record the speed of a moving tissue or fluid, also its direction. It is used for instance by the police in "speed-cameras" and
geologists to record earthquakes and crustal movements. It is used in medicine to record the flow, (direction and speed) of blood within vessels such as arteries and veins. In Dunedin Hospital it is only used in late pregnancy to study umbilical artery velocimetry. Therefore, today's diagnostic ultrasound equipment as used in the Dunedin Hospital should only be operating at acoustic outputs that are safe and not capable of producing harmful temperatures.

Dose is a quantitative measure which combines intensity and exposure time. Variation in tissue properties between individuals, as well as scanning conditions, influence dose in an unpredictable way. Age and size of fetal development may also be significant determinants. Fetal dose cannot be precisely quantified, and thus, no data exists on the dose that the fetus is exposed to in the clinical setting. Because of the exposure of vast numbers of the general population to ultrasound, any possibility of harmful effects becomes very important. Although no adverse effects arising from ultrasound examinations during pregnancy have been proven, clinical safety is, and will always remain, a concern. According to Salvesen et al. (1992) clinical safety and the corresponding lack of risk have been assumed rather than clearly demonstrated. Based on all available information the official statement from the American Institute Of Ultrasound In Medicine (AIUM) (March 1993) reads:

No confirmed biological effects on patients or instrument operators caused by exposure at intensities typical of present diagnostic ultrasound instruments have been reported. Although the possibility exists that such biological effects may be identified in the future, current data indicate that the benefits to patients of the prudent use of diagnostic ultrasound outweigh the risks, if any, that may be present.

The Food and Drug Administration (FDA) Office of Technology Department of the American Public Health Service (1995) (Appendix A) stated somewhat differently that:

From a medical standpoint, ultrasonic fetal scanning is generally considered safe, and should be used without hesitation when clinical
benefit is expected. But Ultrasound energy delivered to the fetus cannot be regarded as innocuous (harmless). Viewed in this light, exposing a fetus to ultrasound with no anticipation of medical benefit is not justified.

The National Radiation Laboratory in Christchurch, (NRL) considers that the machinery and transducers used in sonography are very stable. They recommend that operators use clinical quality assurance phantoms as part of a wider quality assurance programme. However, they acknowledge that this is a form of diagnostic technique that is very operator dependent in terms of skill level and time available for ongoing training. For instance, they note that there is no requirement at present for operators to meet any quality assurance guidelines. That furthermore, no audit takes place of the procedures (Personal communication, 1995 [Appendix B]). We will later see that this can lead to ethical problems.

The situation now

It would be unusual to find a woman who would not regard a scan as an important part of her care, just as it would have been difficult in the past to find a woman willing to ignore advice offered so as to spare her infant the curses of the dark forces or to undergo repeated painful blood letting. This move to routine use of technology, and an unexamined faith in its benefits is as much a reflection of changing social values towards technology as it is to the desires of women to see their baby. In an increasingly technological age the technological rituals of pregnancy and birth have been hard to resist, by the few women who have tried. The introduction of this medical technological intervention, which has both personal and more wide ranging social consequences, has occurred in the absence of public debate. Because pregnancy and childbirth are normal life events, this intervention has been introduced to women who are mostly well women. Professor Murray Enkin when touring New Zealand in 1994 talked about the “myths” or invalid assumptions regarding antenatal care.

As carried out today, the most serious “crime” is a missed
diagnosis. This has resulted in the bizarre dictum that 'no pregnancy is normal except in retrospect'. Carried to its logical conclusion, this would mean that 'health is simply a state of inadequate diagnosis.' Excessive diagnostic effort can 'reveal' pathology that is not there, cause unnecessary anxiety, and unnecessary intervention, (Enkin 1994, p.21).

Understanding how ultrasound examination "scans" are experienced by woman and the effect they have on pregnancy is an important concern for midwifery practice. Ultrasound can identify and diagnose fetal abnormality, in terms of fetal structure and physiology. Therefore, the use of "scans" may also have a profound effect on the fetus. A scan which demonstrates an abnormality, can and may lead directly to the abortion of a fetus. It may also encourage an induced labour and premature birth. According to Floyd Davis (1992) use of this routine technology is now an established part of women's life. Floyd Davis describes pregnancy as a normal rite of passage in which the current and frequent use of science and machines is now seen as superior or better to women's previous self knowledge and trust in nature. Paradoxes are evident in the argument of Floyd Davis because of an earlier study on the meaning of responsibility in pregnancy, (Bergum 1989). In this work the responsible woman reported being warned against exposure to machinery such as micro-waves, x-rays and even computer monitors, smoking, alcohol, as well as ultrasound.

There is now a renewed controversy in the medical literature about whether scans have proved to be of any real value as part of the routine antenatal care provided for individual women Newnham et al. (1993) Ewigman et al. (1993) and Wagner (1994). This is because of the widespread introduction of routine scans, before any randomised controlled trials (RCTs) had been conducted. This puts us in exactly the same situation that occurred with the introduction of x-rays and other pregnancy interventions, such as the regular weighing of women. The World Health Organisation in a letter to its members (December 1993) sated
It is fair to say that at the moment the best research shows no benefit from routine ultrasound scanning and the real possibility of serious risk, (Appendix A).

The letter also highlighted the additional and very important issue, the costs of scans. The lack of (RCT's) and possibly, wasted resources, are also issues the New Zealand College of Midwives (NZCOM) continues to find unethical. In 1994 the Public Health Commission produced a revised publication of Your Pregnancy. The book was designed to prepare women for motherhood and ultrasound scans were described under special tests thus,

In this test a picture of the baby is built up by directing sound waves at the baby in the mother's womb. These scans are used quite frequently to find out the position of the baby and of the placenta (afterbirth). They are also used to check the babies age if there is doubt about dates and to make sure the baby is growing normally. Ultrasound scans also help to detect abnormalities of the head and spine. The test only takes a few minutes to do, is painless and can be carried out at any stage of pregnancy. It's often done at about 16-17 weeks. The result is ready immediately. Ask to have someone with you when you have a scan done if you want to, (p. 35).

Although ultrasound was classed as a special test of pregnancy a woman could believe from this that they were more or less routine. Pregnant women are and continue to be, very vulnerable in relation to the advice they are given and any tests or treatments they are encouraged to follow. A number of researchers have all noted that, unfortunately, women's reactions to these past treatments and now more recently scans, have not received the systematic attention from research that they deserve. Enkin et al. (1991), Floyd Davis (1992), Jones (1994) and (Walsh 1995).
Bioethics

According to Engelhardt, (1986) one function of bioethics in the health care setting is to provide a framework for disciplined examination of the ideas and values that help guide significant moral judgements, and guide human practices:

Moral questions and issues addressed in bioethics can not be restricted to the province of physicians. This is so for several reasons; one, because of the widespread use of technological developments in the biomedical sciences which have raised moral issues that transcend any particular professional boundary, secondly, other distinct voices from more marginalised groups now question how physicians on their own, can ever fairly represent others who will have their own special values and world view Engelhardt (1986, p.11).

Midwives, apart from a few exceptions, are women. This fact gives them a particular way of seeing the world and interpreting events. New Zealand midwives have articulated midwifery as a "partnership" between the woman and the midwife, a partnership which is at a political, personal and organisational level. The midwifery profession provides guidelines for the practice of "partnership" within its Code of Ethics (Appendix C ). Honouring this relationship of partnership with women is an ethical stance. Of major importance to New Zealand midwives was the failure of the institutional hospital ethics committees in the area specific to women's health. This fact was made explicit by Cartwright (1988) following the enquiry 1987 - 1989 into the denial of women's rights to informed consent. Since the publication of that report many positive changes have been made to the composition and function of these committees. However, feminist health activists, Sandra Coney, (1993) and Phillida Bunkle (1988) have continued to raise questions about whether patient's opinions will ever be taken seriously in a hospital setting. They argue that because of power imbalances of gender, race, culture and hierarchical barriers, the wishes of patients can, with the best will in the world, be overlooked or ignored.
Warren (1989), and Purdy, (1992) are feminist authors who have focused on issues of significance to the health care setting. These writers provided insights useful to feminist ethicists and midwives. They critiqued traditional mainstream theorists because they did not address issues of oppression and domination. They observed that even when some of the newer ethicists acknowledged there was inequality within relationships, they showed no commitment to end it and so by default they condoned the status quo, which was unethical. They suggested that bioethicists could take a new and more useful direction if they listened and observed the issues that caused disquiet, amongst women health workers, such as nurses and midwives. Warren (1989) a strong advocate for involving ethics in what she called “housekeeping” areas, believed that medical ethics thrives on crisis issues that make the headlines. She stated that they fail to look with any depth at the issues which affected everyday life.

Sherwin (1992) praised the field of medical ethics for its sensitivity to the power imbalance between doctors and patients. She also congratulated many ethicists for developing away from strict utilitarian or deontological reasoning. But then Sherwin was critical of the lack of political analysis by medical ethics. She said that medical ethics accepted the institution of medicine as an appropriate enterprise; which in turn helped the institution of medicine by legitimising norms and never “rocking boats”. Sherwin argued that feminists should be worried about the ever increasing control over women’s lives by medicine, and the expanding dependence of women on male technical skills and authority.

Another important influence on feminist ethics has been Carol Gilligan (1982). In her research Gilligan identified a female tendency to approach ethical problems in a personalised, contextual way. She found that there are distinct masculine and feminine voices in ethical reasoning. The voices of women have been largely excluded or even ignored by mainstream ethical theory. She identified women as having an ethic of care.
Feminist ethics according to Holmes (1992) must include discussions which emphasise the tremendous power imbalance within the organisation of health care. Holmes has said that current medical ethics must also begin to value women and the values that women hold.

Influential writers such as Beauchamp and Childress (1989) have a special interest in medical ethics. They use primarily normative ethics for case analysis and the discussion of ethical issues. (Normative - applying general moral principles to say how things ought to be), (pp.25-62). Some midwives consider that this approach has failed women, in particular women requiring maternity services. Principles which reflect the privileged group that developed them, are not adequate to address the situations and circumstances in which other less privileged people find themselves. They believe that despite increased awareness of human rights and issues of informed consent, technology continues to be introduced and utilised without sufficient information. Essentially there is little evidence of knowledge of the emotional consequences of routine and uninformed technology when applied in real life to women and their families.

Ultrasound examination and the emotional effects on women have been studied in the past. However, the earliest studies were largely conducted using a medical model, with its own distinct set of values and terms of reference. In practice the questions of importance to the, usually male, medical researcher tended to ignore the 'softer' data and language used to describe women's actual lived experiences. The conclusions the researchers have reached were that by controlling the environment of the examination, women would find an examination a positive experience. These controlled trials have been undertaken in centres of excellence with adequate equipment and skilled staff. This controlled approach implies that it is possible to control the environment in which all women undergo ultrasound during pregnancy and so provide the same standards of quality assurance in all settings. This is obviously not the case, for midwives in close contact with many women, know that examinations take place in a variety of settings, ranging from large radiology clinics in busy teaching
hospitals to the more intimate environment of an obstetric / or General Practice room.

One midwife who has applied mainstream ethical theory to inform her work has been Jones (1994). Jones has not examined ultrasound examination in particular, but has compared a utilitarian view versus a deontological view of antenatal screening for fetal abnormality.

A utilitarian view would favour screening with a view to correction of abnormality or abortion. A deontological view would favour screening for the benefit of preparation and correction, Jones (1994 page. 91).

Jones said that this kind of argument was too simple because it lacked the complexity of the lived experience of women and the principle of autonomy was often overlooked in practice when it came to screening in pregnancy. From her own observations and those reported to her, she stated that “the gaining of informed consent rarely occurred”. Put into a wider social and political context she questioned if screening could be considered a step towards creating a master race. Jones started with the mainstream theorists and then incorporated the feminist perspective, by using real life case studies.

In conclusion, feminist medical ethics work at exposing male biases in traditional moral and ethical models. In addition, they argued that the distribution of power is maintained because medical ethics remains within the dominant social and political male order.

Ultrasound can also be presented in a misleading or ambiguous way to pregnant women. For example, scans are sometimes described as "tests to make sure your baby is all right". Richards (1989) pointed out this may be interpreted as a test to prevent abnormality rather than one which may reveal it. Scans are also done inconsistently throughout the pregnancy. Moreover, the reason that each individual woman believes
that she is attending for a scan varies, as do, the other significant events happening to her at the same time. Women sometimes report confusion and anxiety in relation to the scan result. This may also engender a sense of distress at decisions about the pregnancy that they face subsequent to the scan findings.

Answers to the implications of the technology for women need to be judged by reference to “what happens in practice to women, rather than solely by the outcome of controlled scientific trials or theoretical models” (Zander 1981, p.125). Zander suggested that what was good obstetric care might be more a question of ethics, not statistics, as advanced scientific models of obstetric care continually restricted the view of the human experience of pregnancy.

Page, (1995) confirmed Zander's argument when she observed that the indiscriminate use of such technology as scans had pushed pregnancy and birth towards being an increasingly medical event. She stated that birth has been stripped of its social meaning and had been taken over by technology and institutional rituals.

We have a remarkable ability to develop technology, but all too often do not consider its consequences when applied in real life. Tools such as ultrasound and fetal monitoring were transferred without question from the laboratory to the place of practice and used as if they were a panacea for all ills. (Page 1995, p.143).

According to the work of Beech and Robinson (1994), there have been no studies to date that have proved routine scans to be of benefit to women. Some midwives therefore continue to voice disquiet about the way women have been conditioned to expect a scan as part of their routine antenatal care. Beech & Robinson in a major review of the literature stated that after 35 years of use, some midwives and some consumers would continue to question aspects of safety. They claimed that the possibility of ultrasound being used as a new form of global, medically promoted, eugenics as an ethical issue, has received scant attention from bioethicists. Beech and
Robinson were also concerned about the lack of quality assurance programmes and pointed out that there was no way of knowing the number of false positive or false negative scans that had happened. The ethical considerations of such major technical mistakes, which inevitably led to the abortion of some fetuses, following wrongful diagnosis, are rarely reported in the medical literature. Beech and Robinson encouraged midwives, as advocates for the mother and the fetus, to press for proof of benefit and to encourage consumer involvement in the evaluation of this technology (Beech and Robinson, 1994).

**Summary**

History shows that medical research tends to emphasise what should happen from a purely biomedical point of view. This is with little real knowledge or insight into what really happens in terms of live experience. One could argue, therefore, that what is missing is a study to give women the opportunity to use their own words to describe their subjective experience of "scans". Also missing has been the identification of any ethical issues raised by the women when using this technology in real-life situations. The results of a study of the present type may fill this gap, as well it has the potential to be useful research for women and health professionals.
Literature Review

Indication for the ultrasound examination

The literature in this first section is presented in two parts: (i) those papers which support a policy of "restricted" ultrasound examinations, that is, those which are clinically indicated in a high risk population of pregnant women, where a benefit in outcome or management could be anticipated and later demonstrated because of the examination. (ii) the literature which supports a more liberal or "routine" approach. This approach would suggest that all pregnancies benefit from the ability to pick up previously unsuspected abnormalities, even if abnormalities are not amenable to treatment.

Clinically indicated examinations

Leading the way towards a selected or restricted approach to the use of ultrasound has been major health bodies such as; American Institute of Ultrasound in Medicine AIUM (1993), U.S. Department of Health and Human Services, National Institute of Health, Washington NIH, (1984) and the World Health Organisation, WHO (1984). At a more local level a consensus statement by The New Zealand College of Midwives (NZCOM) (1993), states that it does not recommend the routine use of ultrasound, including doppler and cardiotocographic monitoring during pregnancy and childbirth.

A paper by Gonzalez (1984), based largely on information about safety, stated that ultrasound was recommended for a high-risk obstetrical population only. Gonzalez, a member of the American Institute of Ultrasound in Medicine (AIUM) was adamant that because the possible long term effects were not known, only indicated ultrasound examinations should be performed. He suggested that the consensus statement produced by The National Institute of Health, (NIH) Washington, (1984) was the most sound scientific literature for practitioners to follow.
The U.S. NIH (1984) consensus statement provided a list of clinical situations in which ultrasound examinations might be useful, although not mandatory. They listed eleven useful indications, five of occasional value, and seven of only doubtful value. Important points about this list were also noted by Neilson (1986) and are often cited in research. They are:

- Polyhydramnios and oligohydramnios may be associated with lethal fetal abnormalities (e.g., anencephaly and renal agenesis), which may be diagnosed with ultrasound, thus potentially altering management.
- Ultrasound is the only technique that provides definite and immediate confirmation of intrauterine death and should be available, for humanitarian reasons, 24 hours a day in every maternity unit.
- There is no evidence that scans improve the chance of successful cephalic external version, in a breech presentation, but it can detect some predisposing factors including fetal abnormality and placenta previa.
- Uterine abnormalities are extremely difficult to identify during pregnancy, and the diagnosis is unlikely to alter management in any case.
- The fetal biophysical profile is a complex and expensive procedure that may take 70 minutes to complete. Its use has not been conclusively shown to improve fetal outcome in high-risk pregnancies.

Neither Neilson nor the NIH recommended the routine use of ultrasound as a screening tool.

An earlier attempt was made to evaluate the many scientific papers that supported the use of routine ultrasound examinations. Thacker (1985), an epidemiologist, argued that studies needed much greater numbers than had been studied up until that time, to assess cost, safety, and acceptability as well as efficiency.
Thacker’s proposal, the setting up of large randomised controlled trials with up to 12,500 women, has since been undertaken. These large randomised studies are regarded by the World Health Organisation (WHO, 1993), (Appendix A) as providing the best data for both clinical and public health policy to follow Ewigman et al. (1993), and Newnham et al. (1993).

The principles of a clear indication for ultrasound and of the need for informed choice by women has been strongly endorsed by the WHO (1984). They reminded health care providers that there was a moral responsibility to fully inform the public about what is known and not known about ultrasound scanning during pregnancy. To fully inform each woman prior to an ultrasound examination as to the clinical indication for ultrasound, its hoped-for benefit, its potential risk, and alternative available, if any.

This statement was an attempt to stimulate governments to develop their own policy on the issue of scans as the use of scans was increasing rapidly without any control. A second paper from the WHO (1986), reinforced the earlier stance, which again stated that they could not support the use of routine ultrasound and this time further warned against the use of the imaging technique as a substitute for comprehensive clinical assessments. They also warned that screening programmes suffer a disadvantage that any complication arising as a result of the examination invariably affects the people who did not need the test. Also noted was the escalating costs of scans. This fact was reiterated in 1993 (Appendix A) with an open letter to member states drawing attention to two new scientific papers. Both of these papers showed no benefit from routine scanning and a possibility of risk. The two papers were Ewigman et al. (1993), and Newnham et al. (1993), reporting on studies that had used the most respected and rigorous scientific methodology possible, large randomised controlled trials.
The Ewigman paper is often also referred to as the RADIUS study. The RADIUS (Routine Antenatal Diagnostic Ultrasound Study) was a randomized clinical trial conducted in the United States. It compared the outcome of pregnancy in low-risk patients undergoing routine examination, versus ultrasound when indicated. Examinations were carried out at 28 centres. Some examinations were conducted at tertiary centres others were not. In all cases there were quality assurance checks in place. The other study was conducted in Perth, Australia, by Newnham et al. (1993).

Ewigman studied the perinatal outcome of over 15,000 pregnant women who either received two routine scans at 15-22 weeks and 31-35 weeks, or were scanned for medical indications only. Results showed that the mean number of scans in the first (routine) group was 2.2. And in the control group (on indication only) was lower at 0.6. The rate of adverse perinatal outcome (fetal death, neonatal death, neonatal morbidity), as well at the rate of pre term delivery and the distribution of birth weights was the same for both groups. In addition the ultrasonic detection of congenital abnormalities had no effect on perinatal outcome. There were no significant differences between the perinatal outcome in the subgroups of women with post-date pregnancies, multiple-gestation pregnancies, or infants who were small for gestational age. Conclusions drawn from this study were that routine screening scans did not improve perinatal outcome as compared with elective scan on the basis of clinician judgement (Ewigman et al. 1993).

The second paper, by Newnham et al. (1993) also a randomised controlled trial, looked at the safety of repeated prenatal ultrasound imaging. And while the original purpose of the trial was hopefully to demonstrate the safety of repeated scans, the results were the opposite. From 2834 pregnant women, 1415 received scans and continuous-wave doppler flow studies at 18, 24, 28, 34 and 38 weeks gestation (intensive group) while the other 1419 received single scans at 18 weeks (regular group). The only difference between the two groups was that intrauterine growth retardation (IUGR) was significantly higher (one third more) in the intensive group. This important and serious finding prompted the authors to state
in their conclusion, "It would seem prudent to limit ultrasound examinations of the
fetus to those cases in which the information is likely to be of clinical importance"  
(1993, p 890). It is ironic now that it is likely that scans may have led to the very
condition, IUGR, that it has for so long claimed to be effective in detecting.
Women should not now be receiving this type of examination early or repeatedly
during pregnancy.

Since the publication of the RADIUS study there has been much debate and
some criticism (Romero 1993); (De Vore, 1994); (Chervenak and Mc Cullough,
1994); (Reed, 1996). One major criticism of the RADIUS study has been that it was
insensitive in the detection of fetal anomaly. An analysis of the study by De Vore
(1994) noted that tertiary centres detected 6.8 abnormalities per 1000 patients while
non-tertiary centres detected only 1.7 per 1000. This analysis concluded that
ultrasound was cost effective in detecting fetal anomalies only at tertiary referral
centres. De Vore believed it would be unfortunate if pregnant patients were not
offered an ultrasound examination, since the examination should be an integral part of
obstetric care. In a later paper by the same author (De Vore, 1996) the RADIUS
study was compared, again unfavourably, to a more recent study by Leivo (1996), for
the same reasons, fetal anomaly detection rates.

Romero (1993) criticised both the design and conduct of the study, saying they
were both basically flawed. He asserted, that they had insufficient numbers in each
arm to clearly demonstrate either benefits or disadvantages of routine ultrasound
examination. Therefore, the study lacked statistical power to detect any effects.
Additionally Romero criticised a lack of detailed information in the research report.
He noted that this lack of information made it difficult to fully analyse the study
results, and that crucial information about the types of fetal anomaly missed by the
operator was not presented. He argued that the conclusions drawn were too simplistic
and that this was in part due to the difficulty of designing studies to match rapidly
evolving technology.
A further criticism of the RADIUS study has been made, on ethical grounds, in an editorial by Chervenak and McCullough (1994). These writers have argued for consideration of the ethical principle of respect for autonomy and beneficence. In their strongly worded paper they reasoned that the lack of benefit and excessive cost as cited in RADIUS were inadequately proven. The authors referred to the term PICS, which stands for prenatal informed consent for sonogram. They argued that the definition of benefit to women in RADIUS was too narrowly applied to clinical benefits and ignored other benefits that women might value. This editorial is in most respects a more up-to-date version of an earlier paper by the same authors. In 1991 Chervenak and McCullough described ethics as an emerging subdiscipline of obstetric ultrasound. In that paper they stated that there were clinical dimensions that only ethics could identify and address. Specifically they questioned the adequacy of the U.S. NIH (1984) consensus statement which was critical of routine ultrasound examinations. Thus, they argued, that the principle of beneficence and respect for autonomy should form the basis for providing all women with the offer of routine ultrasound examinations.

Threats to the autonomy of pregnant women, based on the consensus statement by the NIH (1984) was discussed previously by Chervenak, McCullough, Chervenak (1989). The purpose of their paper was to describe PICS, and to suggest that PICS should be given the same weight in clinical judgement and practice as beneficence-based indications. The authors were sensitive to the possible outcomes of the examination and recommended that adequate counselling and support be available for all women. Feminist perspectives on ethics have shown that unfortunately, principled ethics often fail women. One obstacle to respecting autonomy, by using informed consent, results from the imbalance of power inherent in the relationship between patients and medical professionals. For PICS to work, every health professional would have to be sensitive to the educational, linguistic and religious differences of each woman. They would also need to recognise and respect the potential impact of race, ethnicity, class and culture on the decision making process.
In *A Guide to Effective Care in Pregnancy and Childbirth*, (Enkin M, Keirse J, Chalmers I, 1991 ed, p. 56) the researchers argued that,

The place, if any, for routine scans in pregnancy has not as yet been determined. In view of the fact that its safety has not been convincingly established, such routine use should for the present be considered experimental, and should not be implemented outside of the context of randomised controlled trials.

In this text the relationship of excessive diagnosis, unnecessary anxiety and unnecessary intervention associated with ultrasound examination was discussed at some length. The study also discussed the other negative effect, inappropriate reliance on this technology, in that it eventually deskills practitioners and undermines complex clinical expertise thus leading to a reduction in clinical confidence.

Le Fevre et al. (1993) also found no benefit from routine screening scans. In this study 15,530 women were randomised to test a hypothesis that routine scans in low-risk pregnancies would improve perinatal outcome. A secondary hypothesis addressed in this article was that routine screening scans would have a favourable impact on maternal management or outcome. Pregnant women without a specific indication for scan examination in early pregnancy were randomly assigned to have either two routine scans or conventional obstetric care. Pregnancy interventions and maternal outcomes within the two groups were compared. There were no significant differences in maternal outcomes. Suprisingly the use of scans was markedly higher in the routine group. The rates of abortion, amniocentesis, tests of fetal well-being, external version, induction and caesarean section and the distribution of total hospital days were similar in the two groups. Only the use of tocolytics, a medication to initiate labour, and the rate of post date pregnancy were slightly lower in the routine scanned group. The authors concluded that routine scans resulted in no significant benefit.
The Association for Improvements in Maternity Services, UK, (AIMS) in February 1994 brought out a special updated journal on ultrasound, 'Ultrasound unsound' in which Beech and Robinson expressed strong views on the potential harmful effects of routine ultrasound, both of the technology itself and the emotional harm to women. Beech and Robinson offered a comprehensive and well researched overview of the massive growth of obstetric ultrasound. The information presented had been gathered over twelve years from a variety of reputable scientific journals. The journal was also critical of the medically orientated approach to present research, which had little consumer involvement. Evidence presented in this journal showed that at best, routine ultrasound examinations brought no benefit to most mothers or babies, at worst, some harm could be caused.

Dr Marsden Wagner in his book, 'Pursuing The Birth Machine : The search for appropriate birth Technology', (1994) supported the work of previous researchers. Wagner examined the efficacy of all medical technology related to pregnancy and birth, including ultrasound. His findings showed that scientific data does not justify the widespread routine use and escalating cost of ultrasound scanning. He highlighted the lack of service provision for the psychological, emotional, and social factors involved when such tests were used indiscriminately. Psychological harm caused by any routine prenatal care, including ultrasound examinations, was also a major concern to the French obstetrician Odent (1995). Odent, in his campaign for eliminating the 'Nocebo' ('I shall do no harm') effect of prenatal care, counted ultrasound examinations as a potential source of anxiety for women because the examination was always focussed on possible problems. Odent discussed the emotional state of the pregnant woman as a probable important factor influencing fetal development. This was based on the knowledge that being unhappy or depressed were characterised by a high level of glucocorticoids, and that these hormones were inhibitors of fetal growth. It is also well known that all the opiates, including the endogenous opiates (endorphin's), are inhibitory growth factors. Endorphins regulate cell proliferation and cell differentiation. Zagon and colleagues found that (Met0)-enkephalin is the most potent opioid related to growth and its specific receptors have been identified (zete' receptors).
Therefore, emotional states as well as painful experiences associated with increased levels of glucocorticoids and endorphins are likely to reduce the growth of the fetus. The more aware we are of the importance of the emotional state of pregnant women, the more we will take into consideration the possible nocebo effect of prenatal care (Zagon 1995, p.2).

Women have always suspected that there existed a strong psychological relationship between the mother and fetus. More recently this has been proved by scientists in other fields of medicine. Huttunen, (1978) established a direct link between the emotional states of the pregnant woman and the health of the child through life and into adulthood. This Finnish study demonstrated that those children who were a fetus when their fathers died during World War 11, were more at risk of alcoholism, mental disease and criminality, than those who lost their father during the year following their birth. It was found in an Irish dental study (Torney 1994) that the main risk factor for being in the 'high caries group' by the age of two was a major stress to the fetus during the pregnancy. The results of these two studies would suggest that tests which have the potential to emotionally harm pregnant women should not be used routinely.
New Zealand literature.

Duff (1992), in response to criticism of the growing use of ultrasound, presented a medical opinion to support the use of clinically indicated diagnostic ultrasound. He classified five medical indications where a benefit would arise to either the women or fetus. He listed them as:

1) doubt about fetal maturity and the expected date of delivery;
2) concerns about growth arising from abnormalities in a previous pregnancy or the current pregnancy;
3) abnormalities such as vaginal bleeding or pain;
4) the possibility of multiple gestation;
5) the possibility of fetal abnormality.

Unfortunately the benefits from ultrasound examination are not a matter of a simple checklist. It is more a matter of confusion and complexity. For instance, multiple gestation was shown to be detected earlier in women who had an ultrasound than women who did not (Ewigman et al. 1990). Later research has shown however, that no benefit from this earlier detection has been established for either the mother or fetus (Neilson et al. 1995). Routine second trimester ultrasound has been shown to detect more fetal abnormalities than selected ultrasound (Saari-Kemppainen et al. 1990). Yet more recent trials have been critical of the small percentage of abnormalities that are detected by 24 weeks gestation (Ewigman et al. 1993). One recent survey looked at the specificity of ultrasound in which the accuracy of the diagnosis of fetal abnormality was checked during the post mortem procedure. Results showed that at least one in two hundred abortions performed for fetal abnormality was on a fetus that was normal or a fetus that had only minor abnormalities which were incorrectly diagnosed as major (Brand et al. 1994).

Routine Examinations

I found very little research to support the clinical or emotional benefits of routine ultrasound examination. Certainly there was no support from any of the major
professional colleges or health authorities. Two audit papers from New Zealand did point out that ultrasound examination was, by and large, a routine procedure during pregnancy (Bange and Gendall, 1987) and (Buckingham et al. 1991). Affirmative views for routine ultrasound have been put forward by Youngblood (1989) Romero (1993), De Vore (1994), Chevernak and McCullough (1994), Reed (1996). These are not necessarily based on empirical research but more as strongly held beliefs by experienced health professionals.

Youngblood (1989) believed that routine ultrasound was not only beneficial but always indicated. He cited many benefits in early pregnancy such as dating of the pregnancy; the diagnosis of intrauterine growth retardation, the capacity to diagnose multiple pregnancies, placental localisation, the detection of fetal anomalies, otherwise overlooked maternal abnormalities, and finally, the positive emotional, behavioural and psychological effects on the mother. Youngblood noted that even where a more conservative approach to ultrasound was advocated in theory, in practice, routine ultrasound examinations were performed. This was not because of the medical indications listed in some guidelines, but because of patient demand. While one cannot deny that some women do demand this examination, the motivation for this is worth examining. Some anecdotal evidence suggests that women feel that they are getting sub-standard care when they have not had their routine ultrasound. The results of this present study may go some way to explaining further the issues surrounding 'maternal choice' or 'demand' for ultrasound as noted by Beech and Robinson (1994), and Youngblood (1989).

Both De Vore (1994) and Romero (1993) believed there were clear benefits to women for assessing gestational age, multiple pregnancy and placental localisation. Cost benefits are most likely to be found in the detection of fetal anomaly and in giving couples the option of pregnancy termination. Reed (1996) was critical of the way research into routine ultrasound had focussed on cost benefit analysis and the way in which patient interest and patient education had been dismissed as of no worth. Finally Chevernak and McCullough (1994) maintained that on ethical grounds the
provision of routine ultrasound examinations was a dimension of prenatal care that could promote a woman's autonomy and provide benefit.

One of the paradoxical things about the ultrasound examination is that the very existence of the test means that women are forced to make a choice. This fact was highlighted by Gregg, (1993) in a qualitative study that explored pregnancy, technology and choice from the standpoint of a small group of women. Gregg found that women actually felt burdened with their own choice and other people's expectations that they should make the "right" choice. In that study women reported that they certainly faced pressures from family members, friends, co-workers and the popular media to have all available medical tests, which included the ultrasound examination. Gregg (1993, p53) observed that, "women make many choices in an attempt to take back some control of the pregnancy process". I understand from this that Gregg meant women tried to retain their integrity and to respond appropriately to their needs and those of their babies.

New Zealand researchers Bange and Gendall, (1987) found that routine ultrasound examinations were highly favoured by obstetricians. In their retrospective five month audit, carried out at Waikato Women's Hospital, of 1,021 maternity patients, 92.6% had at least one examination and 86.2% of all patients were examined by ultrasound before twenty six weeks. The examinations before twenty six weeks resulted in dates being changed by two weeks or more in 14.3% of the women. Bange and Gendall stated that even for women who were sure of their last menstrual period, the date was "reassigned", by as much as two weeks in 7.4% of subjects. It is uncertain what help or effect if any, this reassigning was to the women who already knew when they had conceived. In an editorial Reed (1996) indicated that many women in her practice were affected by uncertainty of dates. However, Beech and Robinson (1994) reported situations where the baby was induced because obstetricians claimed that the pregnancy has gone way beyond term, but a premature baby was in fact delivered. The Waikato research did not report on the maturity at birth of the babies whose delivery dates were reassigned, and therefore empirically
unsupported findings were acted on.

Conversely, there have been cases where the woman has said that she is overdue and has not been believed because the ultrasound showed a different expected date of delivery. In one such case a woman in England was given drugs to suppress what the staff believed to be a premature labour, despite her protests, and a full term baby was tragically delivered dead (Beech and Robinson, 1994). This is not an isolated case as I have known women who had incorrect diagnosis made. It is difficult to quantify the frequency of errors as no records are kept.

The study by Bange and Gendall, (1987) also found that the routine examination was an important factor in later pregnancy management when 12% of women required induction of labour, so justifying routine scans at 16-20 weeks gestation. Absent from the Bange and Gendall paper are any details which might show in what way the pregnancy management actually improved the situation for either the mother or fetus. Even so they recommended the continuing use of routine examinations by ultrasound for all women between 16-20 weeks gestation. More recent studies have found that an individual woman's risk of being induced, (having labour artificially started), is more dependent on the rate of inductions in her local hospital than on the dating of her pregnancy with ultrasound (Beech and Robinson, 1994).

Similarly Buckingham et al. (1991) carried out a retrospective audit in Dunedin and examined the maternity notes for one calendar year. The study had three goals: (1) to determine the percentage of pregnant women who had an ultrasound examination; (2) to determine the number per patient; (3) to determine the prevalence of fetal anomalies detected. Two thousand and forty-five pregnancies were registered during the year at the maternity centres. The study found that 71% of women that were known to be pregnant had one or more examinations. There was a mean of 1.5 examinations per woman; 68% of women had one only and 32% had two or more examinations. Of the fetal anomalies detected, 0.4% had a major anomaly of the
central nervous system and 0.7% had renal hydronephrosis. The authors noted the relative rarity of fetal anomalies found in this study, a result which was similar to results in other larger studies. There were four cases classified as false positive and four cases of false negatives in the examination results when the notes were checked against the birth records. They concluded that ultrasound examination had become almost a routine part of antenatal care in Dunedin. They did not present clinical grounds to justify that practice, nor did the authors explore the effect, if any, that a wrong diagnosis may have had on any woman and her fetus.

Summary of the literature.

The studies by Bange & Gendall, (1987) and Buckingham, (1991) demonstrated the perceived usefulness or convenience of ultrasound for health care providers. This convenience is then taken as sufficient reason to justify the routine use for all women. This has occurred even when reports from such eminent medical bodies as (WHO), (ASIM), and (NIH), stated clearly that more studies were needed to prove or establish the role and safety of routine ultrasound examinations. Consensus-development conferences and other similar conferences that air all sides of a scientific controversy rarely resolve strong disagreements by issuing reports. The strength of the consensus-development approach lies in bringing together experts who represent many different disciplines and who have not staked out a position on the issue. It also presents an opportunity for various groups to hear and debate the scientific evidence.

Overall, the conclusion I reached from reading the literature, was that the majority of the research studies showed agreement that routine screening by ultrasound examinations in low risk pregnancies was not effective. This was because they:

1. were not shown to be cost effective;
2. were not significantly accurate in diagnosing fetal abnormality;
3. did not lead to interventions that improved perinatal outcomes;
(4) ignored the long term effects;
(5) led to unnecessary interventions;
(6) increased maternal anxiety.

The main arguments in favour of routine ultrasound can be found in editorials, commentary and opinion pages of the medical journals. One could make the generalisation that health professionals have become accustomed to using them, and they feel obligated to provide them as part of the provision of appropriate prenatal care. Recall that Chervenak and McCullough (1991) also made a case for ethics as an emerging subdiscipline of obstetric ultrasound. If one is of the opinion that all pregnant women are also patients, then the support for routine ultrasound gains strength. Indeed by failing to offer a woman a scan one has failed to give her choice, thereby diminishing her autonomy as a patient.

**Relevance of this part of the literature review to the study.**

I was interested to find out what indications were needed for a woman to attend for a scan in Dunedin. One viewpoint missing from the literature was that of pregnant women. This is one area that my study was designed to address. For instance I wanted to find out just how helpful it is for women to have the expected date of delivery confirmed by the examination when they are not sure of this themselves. In the past, women dated the pregnancy from such things as breast or bladder changes. Twin pregnancies were often suspected by the woman and her family, based on the rapid and excessive change in size, plus lots of fetal movement. Later in the pregnancy, two heart beats and feeling extra limbs would confirm the woman's suspicions. The fact that the woman noticed most bodily changes and then had them clinically confirmed tended to reinforce the woman as the expert on the pregnancy. Does it matter that the technology of the ultrasound can pre-empt the woman's feeling about the pregnancy? We might argue that it probably can provide her with earlier and more accurate information.
I have concluded this section with a standpoint from Fletcher (1981) an epidemiologist. Fletcher has outlined a minimal criteria specifically for a prenatal routine ultrasound examination. He believed that:

Since routine ultrasonography is performed to detect unsuspected conditions, it is a screening test. As such, routine ultrasound examination must meet several criteria to justify its use. It must have a high enough sensitivity to avoid missing problems, and an acceptably high specificity to avoid working up too many false-positive diagnoses. Patients should find it comfortable, accessible and quickly performed. It should not cause adverse effects for the mother or fetus. Effective therapy should be available for problems detected. In addition, early diagnosis in the screening phase must offer therapeutic benefits compared with later diagnosis by more selective ultrasonography. Finally, the benefits of routine ultrasound testing should justify its cost as measured in economic terms as well as in human suffering. (Fletcher 1981, pp.1167-1168).
Associated costs, reasonable costs and resource implications.

I found no studies that examined the monetary costs incurred by women when attending for an ultrasound examination. Countries differ in what services are provided free from public taxes for pregnancy care. In some instances individual women have to pay for the examination, either directly or by private health insurance. Currently in New Zealand all women are provided with a comprehensive free pregnancy, labour and childbirth service, which includes as many ultrasound examinations as are required. Women may still chose to opt out of this arrangement and pay for private care.

Berwick and Weinstein (1985), measured the willingness of women, in a normal pregnancy, to pay for ultrasound. The results of this study found:

Women were willing to pay on average up to $US 706, for the information gained by the examination, even though the subjects knew that the local charges for this examination were only $65. This was up to 20 times higher than the local charges. Attitudes of subjects towards learning the sex of the fetus were particularly variable as 43% of subjects said they would pay not to have that piece of information. And subjects were unwilling to pay much more than $5 for the photograph of the fetus even though these were classed as highly prized treasures.

There was no discussion in the above study about the payment for videos of the fetus. A simple explanation for this may be that the use of the video was not common practice at that time. Furthermore The U.S. American Food and Drug Administration (1994), issued a warning to operators that this practice was not justified on the grounds of safety and cost (personal communication Walter Snesko, FDA. 1995). (Appendix A).
The effect of income on willingness to pay in the Berwick and Weinstein (1985) study was paradoxical, as the women with lower incomes were willing to devote a higher proportion of their income to such "luxuries" as non-medical information. Women with lower incomes were more likely to be of a lower social class. Women of lower social class often received less information and so [it is understandable that they] would seek out more information. Having low confidence in expressing one-self can result in poor communication skills. It was shown by Brink-Muinen (1997) that, when specific attention was paid to information giving, women developed more responsibility for their own bodies and lives. This in turn seemed to help the health professional have a greater respect for the patient's personal and social circumstances. In the above situation paying for information was an attractive option. It could be said that to do otherwise was just letting things happen to you, rather than taking control of the situation. Berwick and Weinstein, (1985) noted that the usual cost-effectiveness analysis studies might overlook the value that patients attached to information gained by such examinations as information for its own sake.

Health economists, Mooney and Lang (1993), made a strong case for looking at the benefits of ante-natal screening. They argued that economists in the past have ignored other potential benefits from screening, beyond those arising from the opportunity to abort affected fetuses. They found evidence that most doctors would counsel women whenever screening was available towards abortion for an affected fetus and towards screening for handicap. They claimed that this was in turn another cost to society.

where screening programmes are introduced, the public is then less prepared to support a child born with now 'avoidable' handicaps. Moreover this changing of society's core values has never been reflected in economic appraisal studies. (Mooney and Lange 1993, p. 874).

Mooney & Lang recommend that health economists should investigate what women consider is a benefit to them from screening, apart from abortion
opportunities. In the present study I did not ask the women if they needed or received any counselling. I could find no New Zealand studies that have looked at the availability of counselling during pregnancy. A number of overseas researchers have examined different approaches towards counselling, following a diagnosis of fetal abnormality, for instance the study by Marteau et al. (1994). That study supported anecdotal evidence that suggested that different health professionals differed in both their approach to counselling and their attitude towards fetal abnormality. Genetic nurses, geneticists and obstetricians were studied. It was found that obstetricians counselled in a significantly more directive fashion than did geneticists, who in turn reported counselling in a more directive way than did genetic nurses. Observational studies (Smith and Marteau 1995) of midwives and obstetricians showed that they provided very little information about ultrasound examinations, and were even less able to counsel about what conditions the examination might detect and what that could mean.

That the cost of ultrasound examination was not cheap was discussed by Wagner, (1994) in the book 'Pursuing the Birth Machine' which identified that France, Australia and Britain were now spending huge sums on this technology. For instance, research in Australia revealed that antenatal ultrasound cost more than all the other forms of care to women for pregnancy, labour, birth and the post partum period combined.

In New Zealand a woman may go to a public provider and will receive as many ultrasound examinations, free of charge, as are considered clinically necessary. Private providers of ante natal care can charge a fee for ultrasound examinations for pregnant women (personal communication, 20.12.1995). Payments of $83.80 for the first scan and $41.90 for subsequent scans are made from Health Benefits Ltd. Detailed claim information only goes back to mid 1994, the date of the first maternity claiming system. There are currently two systems in place which record claims and payments, but this situation is being improved. Therefore, interpretation of information related to the cost of the ultrasound service must be considered with caution. Information for
Dunedin and Otago for the year 1995 showed that there were 4,900 maternity ultrasound claims made and the total amount paid for these claims was $375,885. There were 2,400 live births and approximately 550 termination of pregnancies. The trend is for a decline in registered live births for Dunedin and for the Otago area. It will be interesting to see if this downward trend is reflected in expenditure for ultrasound services.

Inefficiency is unethical. If patients are not to be deprived of care from which they could benefit, doctors must make evaluation and efficiency the priorities that dominate their practices (Maynard, 1987, p. 1539).

A focus on health policy has resulted in part from rising health costs and an increasing consumer involvement in medical decision making. In addition it has been estimated that only 15% of medical decisions are supported by sound scientific evidence (Eddy, 1990). Wilfond (1995) described the way health policy and setting priorities about medical services occur. Specifically the paper focused on the role of clinical evidence for a screening policy for Cystic Fibrosis. Wilfond suggested that “The Extemporaneous Model” usually has sufficient force to win the debate. The extemporaneous model is one that has patients and patient advocacy groups on side, as well as industry representatives and company shareholders. Wilfond also claimed that it was the action of pressure groups and political expediency that in turn determined the utilisation of and reimbursement for service. One could argue that the policy related to routine ultrasound examinations has occurred in an extemporaneous fashion. As the introduction and adoption of such a major public health intervention seems to have occurred without the logical consideration of costs. Other researchers have found that fee-for-service incentives can also distort clinical judgement. For instance Woolhandler, (1995 p.1706) found that

Physicians who own their own radiological equipment will order four times more imaging than others. Doctors also boosted their ordering of tests when payment rewarded testing.
A commentary by De Vore (1994) on the costs associated with routine diagnostic ultrasound suggested that saving can be made when quality services were encouraged. De Vore (1994) recommended a system whereby reimbursement would reflect the quality and interpretation of the examination. De Vore noted that in the RADIUS study tertiary centres detected 6.8 abnormalities per 1000 patients, while non tertiary centres detected only 1.7 per 1000. This meant that ultrasound was only cost effective in detecting fetal abnormalities at tertiary referral centres. De Vore suggested that each doctor should submit the identification rate of malformed fetuses. If the rate was greater than five per 1000, only then would the doctor be entitled to full reimbursement. De Vore (1996) in an opinion paper, considered again the implications of the RADIUS study for patients and health professionals compared to more recent research evidence found by Leivo (1996). De Vore reiterated that if done responsibly, routine ultrasound examinations could be provided in a cost effective way.

Reed (1996) believed that the benefits to women of offering routine ultrasound far outweighed the costs, and suggested that all women be offered the service. Reed found that a large percentage of pregnancies were at risk because of uncertain dates. Other reasons she gave to support routine examinations were for parental interest and education, as well as parental preparation in the event of congenital abnormality. In her experience she found that, information gained from the examination had the potential to improve the relationship of the mother both with the health service and the provider, as well as with the unborn child. Thus, she claimed the reasons not to perform routine examinations as demonstrated by the RADIUS study were inadequate. She said that a deeper understanding of the risks associated with all pregnancies negated the excessive cost argument as indicated by RADIUS (Reed, 1996).

Wide debate seems to accompany the provision of all screening procedures. Fletcher (1997, p.1182) discussed the general benefits of screening for breast cancer and noted that
Where scientific disagreement is strong, policy makers should take note and move cautiously, if at all. When medical scientists disagree about the effectiveness of an intervention, it almost always means that whatever effect may be present, is small.

One of the questions that arose from the RADIUS study, for Romero (1993) related to equity of access for all women. He was concerned that health care policy in the U.S.A would be based on the study findings. He felt that this might result in poorer women being denied access to ultrasound. Romero claimed that the poor outcomes, such as a missed diagnoses, were related to particular operators and not to the technique of ultrasound.

**Summary**

While the most visible ethical dilemmas emerge in the context of individual decision making, equally important problems arise in the development of clinical services and in the formulation of public policy regarding access and financing. Public policy should address any prohibitive travel or transportation costs. The challenge for public policy that increased health care technology like ultrasound has created is three fold: to provide equal access so that poorer women are not denied it, to direct good decisions making about the times when an ultrasound examination can be of benefit, and to stipulate if it should be available only at centres of excellence or available everywhere.

Despite the many criticism of the RADIUS study it does provide a benchmark for the assessment of obstetric ultrasound in other countries. Therefore to gain the savings as suggested  by De Vore (1996) and Reed (1996) requires high levels of sensitivity and specificity. Reliable detection of anomalies demands high quality
equipment and trained personnel, with exposure to reasonable patient numbers to allow for continuing experience. Probably this can only be achieved by centralising services. The controversy related to routine use, which is ultimately related to cost effectiveness has not been addressed in any serious way in the New Zealand literature.

Other more pragmatic questions surround the amount of use that can be obtained from new equipment to cover the expense of the initial capital outlay. Do they need to be in use all the time? As well as this, how frequently should old equipment be replaced by something newer that is considered to be more state of the art? If the RADIUS study was replicated in New Zealand what would the findings be? Rothman, (1986) advised that we have entered the information age in medicine. The receipt of information on the fetus has become an expected part of pregnancy. She observed that the pressure to gain as much information as could be gathered by medical science, came from the public and the professions, with little regard for costs.
Informed consent, safety and accuracy of results

Informed consent has remained a focus of intense interest in health care since the Nuremburg Code was adopted in 1947. Attention has centred on two general aspects of informed consent; the legal and ethical consequences, and to a lesser degree the practical effectiveness of this in the clinical setting. The present study was concerned with all of these issues. The idea of informed consent has its origins in law, ethics, and the contemporary understanding in medicine about the nature of the doctor-patient relationship. The core notion is that any decisions about care involving a competent person are to be made in a collaborative manner between the patient and the doctor. The patient's authorisation for a diagnostic procedure should be intentional, substantially non-controlled, and based on substantial understanding.

When examining the literature for this section I was looking for a social framework for informed choice and consent to an ultrasound examination. This was so that I could make comparisons with the experience of women's health lobby groups and patients advocates who have written and reported on this issue. I found that in theory there was general agreement that ultrasound examinations warranted the legal and ethical principle of informed consent as a principle which would enhance the woman's autonomy.

The one exception to this principle came from Kremkau (1984), who adopted a rather paternalistic attitude. Kremkau's contrary view seems to be premised on the belief that ultrasound examinations appear safe and a clinical indication must be present for the examination to take place. Therefore, there is no need for informed consent. He argued that "patients should be informed that there is no basis for judging that ultrasound imaging produces any harmful effects in mother or baby". He acknowledged that it was difficult to make firm statements about the clinical safety of diagnostic ultrasound and stated that, "However, heretofore unobserved effects could be occurring. Thus the examination should not be used indiscriminately, ie, just for
fun or to watch the baby" or undertaken lightly (Kremkau 1984, p.274). Kremkau pointed out that safety could be increased by minimising exposure and that this could be done in three ways:
1. Using ultrasound only when indicated;
2. Minimising exposure time;

The legal requirement of informed consent for any diagnostic or therapeutic procedure has been clearly set out by Justice Kirby (1983). He argued that it was a necessary requirement for adequately informed consent to be obtained before any test was done to patients that could breach respect for autonomy (their right to self determination). He also claimed on consequentialist grounds, that health care in general was improved if adequately informed consent was given. Kirby maintained that just because a test or procedure was simple, or commonly known to a patient, that did not provide the professional with a reason not to provide information nor seek informed consent.

This legal viewpoint on informed consent specifically for diagnostic tests has more recently and more strongly been reiterated by Judge Cartwright (1988), with particular emphasis on what needed to be done in this area for New Zealand women. Major problems associated with this fundamental principle were brought to the public's attention by the Report of the Cervical Cancer Inquiry (1988). Judge Cartwright was clear that the principle of informed consent was patient centred and applied to all health care procedures. Ultrasound examination performed on a pregnant woman, to examine her baby, is indeed a health care procedure.

An early proponent of providing written information leaflets and consent forms to women was the American childbirth educator Doris Haire. This was based on her belief that the safety aspects of the test were not satisfactorily proven. She recommended a three-part form for the women to read and keep. Essentially it would have details of the indications or need for the scan, a space to record information
about the equipment to be used, the type of equipment, intensity and exposure setting, and finally the women's informed decision and consent (Haire, 1984).

The idea of a written form has also found favour in Australia and Britain where the Association for Improved Maternity Services (AIMS) produced a similar form 'Who's Having Your Baby', (1993 p. 30-32). The association, like Haire, advises women to keep a complete record of ultrasound exposures to baby, so that at some future date, there would be evidence to assist any studies assessing the effects of ultrasound. On this matter of written information, Davies (1985) wrote

Health professionals have an obligation to do more than give patients facts. They have to develop an effective and sincere communication manner so that information is mutually understood.

Davies drew attention to the problems inherent in communication because of the uneven power distribution between health professionals and patients which could mitigate against promoting the patient's autonomy. She made the point that because women would always know less than those caring for them, women were at a disadvantage. Furthermore, the health professional was meeting each woman from the advantage of his/her own place of work. As the work place is known and comfortable to the professional, and the woman on the otherhand is the visitor, so therefore she is again at a disadvantage. Some feminist authors such as Warren (1989) have argued that the process used to gain informed consent is more important than the outcome. She discussed the type of conditions necessary to foster informed consent, she advised that adverse conditions were when a patient was in an extreme state of anguish or when the doctor had limited time available to answer all questions. Warren stated that we should question just how involved a doctor should be when patients needed to make choices which involved values.

Informed consent is a very well known medical and ethical principle. It has been developed to promote the concept of patient autonomy. Within and across the
language of ethics informed consent is also associated with the fundamental obligation on the part of the health professional to avoid procedures that cause harm (Beauchamp & Childress, 1989). This is important when there is an unanswered question of safety. Meire (1987), Mole (1986), Liebeskind et al. (1982), Taskinen et al. (1990) and Haire (1984) have all argued that safety was still in question with respect to the developing fetus and ultrasound examinations. The closest criteria on for informed consent to ultrasound to match the definition by Beechamp and Childress (1989) would be the definition of Chervenak, F. Mc Cullough, L. Chervenak, J (1989). They have argued for the antenatal informed consent process to be accepted for all scans including routine ones, (PICS) (1989, p.857), “a primarily autonomy-based indication, should be given the same weight in clinical judgement and practice as the beneficence-based medical indications”.

Baston (1988 p.12), an experienced patient advocate, noted that for pregnant women in particular, informed consent ultimately implied only that women have a right to agree with prevailing medical opinion.

No matter how informed an individual women might be, her choices are limited to those which are regarded as 'acceptable' by her medical advisers, there is very little scope for what might be called 'informed dissent', ultimately it is always the health professionals who decide what is going to be counted as risks and benefits”.

This finding was supported by Beech and Robinson (1994) as the result of their work at a patient's association dealing with hundreds of women. These authors found that consent for procedures were less satisfactory for pregnant women, than for any other patients. Bastion, and Beech and Robinson discovered that informed consent in that area of women's health needed protecting as a fundamental legal requirement and that this would be improved or benefited by clearer documentation. More recently Searle (1997) found in a survey of women in Melbourne, that high rates of ante natal screening was achieved at the expense of informed choice and consent.
During the present study I have learned that a new initiative, to make informed choice and consent a simpler procedure for all patients has been developed in the United Kingdom. Two research based leaflets, which focus on the topic of the ultrasound examination, have been produced. One leaflet is for the woman and one for the health professional. The only difference between the leaflets is that the health professional's leaflet has more detail and cites the research references. Both leaflets highlight points which require thoughtful consideration before a woman should attend for a scan. The leaflet designed for women asks three questions for her consideration prior to having a scan.

* Do I particularly want to see my baby before she or he is born?
* Am I unsure about when my baby is due?
* Would I have an abortion if the scan showed there was something seriously wrong with my baby?

If you answer yes to any of these questions, then having a scan may be the best choice for you. If you answer no, then you may choose not to have a scan. The leaflet encourages women to learn more about having a scan either by talking to the midwife or doctor or by asking for the professional's version of the leaflet.

Safety and accuracy have been overriding themes throughout the literature on informed consent. Fourteen years ago Kirby (1983) stressed the importance of the safety of any diagnostic test, more recently explicit concerns have been raised about ultrasound. Safety and accuracy and how those issues affected women complete this part of the literature review.

Meire (1987, p.1122), a consultant radiologist with almost two decades of involvement with ultrasound, stated in a commentary that:

the casual observer might be forgiven for wondering why the medical profession is now involved in the wholesale examination of pregnant patients with machines emanating vastly different powers of an energy which is not proven to be harmless to obtain information which is not
proven to be of any clinical value by operators who are not certified as competent to perform the examinations.

The Director of the Medical Research Council Radiology Unit in England, (Mole 1986, pp. 28-29) pointed out that the most vulnerable organ when the 'usual scan' takes place at 16-18 weeks is the forebrain, as neuroblast division occurs between the 10th and 20th week of pregnancy. If exposure to ultrasound causes death of cells, then the practice of imaging at 16 weeks of pregnancy will cause loss of neurons with little prospect of replacement of lost cells. The vulnerability is for mal-development leading to mental impairment caused by overall reduction in the number of functioning neurons in the future cerebral hemispheres, leading to a possible loss of visual acuity or a hearing loss over a narrow range of sound frequencies.

There is evidence about the effects of diagnostic levels of pulsed ultrasound on the growth patterns on animal cells. The effects could persist over many generations. Liebeskind et al. (1982, p.176) said that the subtle effects of ultrasound might not emerge until the next generation. Her research showed changes in the surfaces of cells, the persistence of abnormal behaviour in cells exposed to a single dose ten generations after. If germ cells were involved, the effects might not become apparent until the next generation. When a woman is examined if she is carrying a female baby that baby is already carrying the next generation's eggs, so that when she becomes pregnant those eggs have already had (X) numbers of examinations.

In Canada, delayed speech development due to ultrasound has been suggested by Campbell, (1983) an ear nose and throat specialist. Norwegian researchers
Salvesen et al. (1992), found an increase in children who were left handed at 8-9 years who had routine ultrasound examinations. However, for those same children the risk of having poor reading and writing skills was no greater than for children whose mothers who had not received ultrasound during pregnancy. Increased pre-term labour and increased levels of miscarriage have been cited by Lorenz et al. (1990) and Saari-Kemppainen et al. (1990), as risks of ultrasound still to be considered.

Accuracy and interpretation of ultrasound have also been noted to vary enormously from centre to centre, along with the experience and training of the operators. For instance, in Wales a public enquiry was set up to look at complaints from women who had been wrongly told that their babies were dead (Beech and Robinson, 1994). In early pregnancy the placenta is very low and may look as if the women has a placenta previa. Research in Finland by Saari-Kemppainen et al. (1990) revealed that out of 4,035 women scanned at 16-20 weeks, 44 were diagnosed as having placenta previa and a further 212 with a marginal placenta. When it came to delivery only four actually had this complication, one of which had been missed at screening. The ultrasound diagnosis of marginal placenta made no difference at all to the outcomes for the babies, but women who were told they had this may presumably have spent the rest of their pregnancies worrying about an operation they thought they might need to have.

Given the evident problems about the complete safety of ultrasound it would seem prudent for this information to be provided, preferably in writing, before a woman attended for the examination. Failure to provide women with this, limits, the process of informed choice. The need for adequately informed consent for diagnostic ultrasound examination has been clearly established by the previous literature in the disciplines of law, ethics and medicine. The same must apply for routine or non-indicated examinations, as they can also result in a woman having to make a choice about the continuation of the pregnancy. For true consent women must be told that the results are not 100% accurate and that there remains some [however slight] uncertainty about the safety of fetal exposure to ultrasound. This fact has been stated

Summary

Safety and accuracy are complex and contentious issues. Early researchers were aware of the potential harm that ultrasound could cause. Enthusiasm by health professionals and women may have overcome some of the anxiety about potentially harmful effects. The examination now is by and large part of routine antenatal care. It is now used by health professionals to search for a problem in apparently healthy women. Essentially it is being used as a screening test. Quality assurance is always a key component for any screening procedure and the implications for the mother and fetus when quality assurance controls fail (as happened in Wales) are enormous. One worrying aspect of this examination is that anyone can buy an ultrasound scanner and use it.

It seems to me that pregnancy care is well suited to the process of informed consent. There are several months in which the health professional can develop a respect for and understanding of the woman's preferences. Moreover, as Enkin et al. (1991) have said "pregnancy tends to be predictable and not subject to sudden emergencies".

Much has been written about both the patient and the health professionals working towards informed consent. It is in this context that I looked for the women's perspective on information sharing leading to them making an informed choice. Was there going to be an ongoing process of education and counselling about the examination?
There have been no randomised controlled trials to examine the effects of ultrasound examination on women's feelings. There have however, been studies which compared different groups of women given different amounts of feedback, either at the time of examination or following it. When ultrasound examinations were first introduced into antenatal care it was the norm for the woman to attend alone. It was also normal for her to be given no information at the time of the examinations and to be prevented from seeing the image of her fetus on the screen. There are reports by Green (1994) of women being forcibly held down during the examination to prevent them looking at the monitor screen. There was no explanation for this other than they had to lie still. In more recent times monitor screens have been positioned so that women can watch the examination while it is taking place.

Studies of women's experience of ultrasound examinations during pregnancy showed that what women liked about the examination was a moving image that was interpreted for them Reading and Cox (1982); Cambell et al. (1982); Reading et al. (1982). The relationship between the personality factors of individual women and the effects that scans might have had on them was studied in detail by Milne and Rich (1981). Pre-scan, intra-scan and post-scan emotional behaviours were compared between different groups of women. The two major findings from that study were that women reported feeling more motherly, and more connected or protective to their babies after seeing the fetal image on the screen. The technique made the fetus visible in such a way that women could 'bond' with the image, and it was the image that women then hold in their minds. The most dominant emotion displayed by women at the examination was one of anxiety. Milne and Rich (1981,p.36) suggested that the scan procedure was an "emotionally charged situation, capable of eliciting moderately high levels of anxiety".
A much more recent study by Zlotogorski et al. (1995) assessed anxiety and maternal coping styles. The authors of the study set out to assess if an ultrasound scan raised or lessened anxiety and to see if anxiety levels were dependant upon a particular person's coping style. The results showed that, a simple clear statement by the operator, that the fetus was well after the ultrasound scan, did alleviate anxiety levels. Those women who actively sought out information appeared to benefit more from the ultrasound scan.

It has been widely believed that 'bonding' is a benefit of ultrasound examinations. A paper by Fletcher and Evans (1983), identified and described maternal viewing of the fetus by scan as a possible method of earlier initiation of parental bonding. Parental bonding is considered the oldest form of human loyalty. They found that contrary to the popular fear that medical science may dehumanise the fetal-maternal bond, a scan examination was likely to increase the value of the fetus for the parents. They noted that the emotional and ethical implications of this phenomenon had not been systematically studied. They claimed that the examination might result in fewer abortions as women would not want to terminate a pregnancy once they had viewed the fetus on the screen. They observed that there had been no studies at that time to look at the effect this early 'bonding' with the fetus had on women who later miscarried. As a social intervention or social control "ultrasound examinations may thus result in fewer abortions and more desired pregnancies" (Fletcher and Evans 1983, p.392).

An interview study of 404 pregnant women was conducted by Hyde (1986) in two hospitals, one which did routine screening and the other only selective or indicated screening. She assessed the impact of ultrasound on bonding by comparing the scores on Cranley's maternal-fetal attachment (MFA) scale, of women who did or did not have a scan. No difference to attachment was found in late pregnancy as other aspects of the relationship between mother and fetus had already been in effect for several months. Hyde's study found that women given routine examinations were more likely to think it a good idea and that anything which was automatically provided
must be safe. At the hospital where it was used only selectively women were more cautious in their expectations. Hyde's study is interesting because it was carried out in the United Kingdom during a small time window when the examination was becoming more common but not quite routine. Furthermore, there was still an element of suspicion by women and their families about this new technology. The opportunity to replicate this particular type of study has disappeared now that ultrasound examinations are more or less universal or routine.

There were a small number of controlled quantitative studies of women's experience of ultrasound screening during pregnancy. Reading and Cox (1982) compared the maternal anxiety levels following scanning between three different groups of women. Group one saw the monitor at the time of the scan and were provided with standardised verbal information about their fetus. These women scored low on assessment of anxiety levels following the scan. Group two were denied visual access to the monitor and verbal information. This second group of women scored higher on assessment of anxiety levels following the scan. The third group were not assessed for anxiety levels until the following day. The findings of the study demonstrated that all of the women in the high feedback group showed less anxiety. Potential benefits of seeing the fetal image that may have reduced anxiety levels were resolution of early ambivalence about the pregnancy and greater maternal attention to medical recommendations.

Reading et al. (1982), conducted a similar type of study, looking at self health care behaviour. Women were randomly assigned to two conditions of ultrasound examination in pregnancy, high feedback or low feedback. Women who received high feedback reported, when asked later, that they had reduced their smoking and alcohol consumption. Smoking and alcohol consumption was reduced significantly in this group compared with the low feedback group. Later studies by other researchers have found no evidence to support this research finding in everyday practice (Green 1990), (Saari-Kemppainen et al. 1990) and (Newnham et al. 1993).
Cox et al. (1987) studied the psychological impact of scans in low and high risk pregnancies. They found that the emotional impact of scans was influenced by the level of feedback provided. High feedback conditions included seeing the monitor and receiving verbal information about anatomical details and fetal activity. Low feedback conditions precluded women seeing the monitor. The researchers concluded that in the short term there was no evidence that the scan procedure caused maternal distress, but that long-term concerns of parents warranted further examination. It is interesting to note from an ethical viewpoint that even women classed as high risk, with either a medical condition or a fetal problem, or both, could be assigned to the low feedback group. This very point was explained by the researchers as acceptable because, "giving patients minimal information is standard practice in many other clinics" (Cox et al. 1987, p674). This is a very good example of the ability of researchers to further erode the informed consent process.

In all of these three studies it is difficult to tell if the women were given the opportunity to express fully their attitudes and emotions. The study took place in the hospital clinic and because of this, a certain kind of power imbalance existed which might have contributed to the women giving the answers that they thought the listener wanted to hear. In the book 'Women's Words' (Stacey, 1991, p.113), the contributors suggest that one has to do more than just record words. They suggested that one must also listen for any contradictions or recurring themes, and not simply make the women's words fit into the researchers piece of research.

One researcher who did identify themes and contradictions, was Black (1992), in her 1985 to 1988 survey of women. She studied a critical aspect of seeing the baby by women who then go on to have either a spontaneous or planned termination of the pregnancy. In this telephone interview study of 121 subjects, results showed that

Forty six (44%) women responded that viewing the fetus on ultrasound had made coping with the loss more difficult. Only a very few, nine women (9%) felt it had made coping any easier. Just as the ultrasound image made the pregnancy "real" for many women, that
extra reality sometimes brought them additional anguish during and after the pregnancy loss (Black, 1992 p.48).

Seeing the baby was thought to have made things more difficult in the short term because it strengthened the bond that was to be later severed. Black suggested that for these women it was unlikely that the ultrasound experience alone was crucial to either successful or unsuccessful coping. The procedure nevertheless entered into the dynamics of their coping with the loss of their baby. Other studies combining detailed feedback with visualisation, have found that this combined approach not only reduced anxiety and gave comfort and pleasure to the women, but also improved the neonatal outcome. According to Field et al. (1995), women experienced fewer obstetric complications during pregnancy and they gave birth to babies who were appropriate weight-for-length, less active and irritable than others when they received feedback.

Recently there is some anecdotal evidence describing women's experience before and after ultrasound examinations Green (1994, p.47), in Prenatal diagnosis : The Human side, and Beech and Robinson (1994) in Ultrasound ???? unsound. They reported women were eager for the examination and thrilled with the idea that they would "see" their baby.

Very few women realise that the main purpose of the examinations is to identify babies with abnormalities and so few women have carefully thought through the implications of this. Nowadays women's main complaint about the examination is that they cannot get enough of them, Green, (1994, p.47).

Women have been encouraged to regard seeing the image on the screen almost as a social event which makes the rather frequent and tedious antenatal visits worthwhile (Beech and Robinson. 1994, p.23).
Sandelowski (1994 p.268) showed that, in contrast to what the medical literature said about the technology being primarily a medical monitoring device, child bearing couples locate the experience within the realm of parental appraisal, acquaintance and care. Thus an ultrasound examination is also a social product, That is to say, the fetal sonagram is made in a social context; its very existence pulls viewers to look at it and pushes them to make something out of what they see. The fetal sonagram is material for inference speculation and projection.

One couple described the fetal image as "looking right at us". The examination provided the expectant parents with a kind of human-machine interaction, what the patients described as a meeting between parent and child. One person reported that they would like to take the machine home so they could see the baby whenever they wished. The scan is something that neither physicians nor child bearing couples want to do without and seeing the fetus on the screen has become a technological pregnancy milestone almost as important as the biological ones (Sandelowski 1994, p.271).

There do not appear to be any studies that have looked at the emotional cost to women when a major fetal abnormality has been found on ultrasound examination, or at the quality of counselling a women might receive. Barbara Katz Rothman (1988), in her book The Tentative Pregnancy found there was a predominant bias towards encouraging women to have a termination for fetal abnormality. She found that the very staff with the ability and time to counsel were not necessarily present when they were most needed. Green (1990), also found that most parents experienced social pressure to terminate an affected pregnancy once it was diagnosed on examination. Another untoward effect of this technology observed by Rothman was that many women suppressed attachment with the baby until after 20 weeks. This was until they had been reassured that there were no malformations. She termed this the 'tentative pregnancy'. Rothman questioned what happened to women and babies when this attachment was delayed until halfway through a pregnancy, long after women have felt
their baby move within their body and she questioned the long-term impact this might have on women's psychology. Whether women did not accept the role of mother until the pregnancy was officially "certified" by an expert? Whether this set up a process for those women where they no longer could count their bodily sensations as being valid?

Despite the consistent accounts by women worried about their babies "jumping" more when they were scanned, the effects of this on women has not been studied. David et al. (1975) reported increased fetal movement during the examination. They found a mean increase in fetal activity of over 90%, as judged by the fetal movement count.

The National Childbirth Trust, (Lambley J, 1985) had similar anecdotal information from members. Women wrote about babies jumping and thrashing around, and even putting both hands up to cover their ears. Women have asked if this increase in movement could contribute to babies being born with the cord around their neck. It is common for a baby to be born with a loop of umbilical cord around the neck. This does not cause any concern as it can be slipped over the shoulder and baby is 'birthed' through the loop. The situation is different when the cord is looped two or three times. During labour the baby has to descend down the vagina. As this descent happens the cord can get pulled tight. In such a situation three things happen. The cord tends to strangle the baby; the blood circulation between the placenta and baby is interrupted. Less frequently the tight cord can delay the descent of the baby and slow the birth. One or all three of these thing can increase the chances of the baby having birth asphyxia. Only when a cord around the neck causes problems at the birth is this fact recorded in the labour and birth records. Therefore, there are no comprehensive records to answer these questions.

Experienced sonographers say they feel that the fetus is blithely unaware of the ultrasound. The babies appear to women to have increased movement because the woman is seeing it on the screen, even though she cannot feel it. They (the fetus)
“rocket” around all the time but women are usually too busy to notice. Some babies sleep through the whole procedure. We know from ultrasound that there are definite rhythms to fetal behaviour. Mothers always say the baby “wakes up” when she goes to bed, “kicks more”, again this is just because she has more time to notice.

**Summary**

Given the increasing use of ultrasound and the relatively few investigations of its impact on women, a study describing the experience seemed warranted for possible insights into practice. To find out if there is, as has been suggested, an element of anxiety attached to the examination appeared to be another useful exercise. In the present study there will be an opportunity to do just that, discover women's feelings about the examination and what particular aspects of the examination they most enjoyed.
Maternal and fetal rights

Deciding what to include and what to exclude was one of the hardest tasks for this part of the review. What weight should I give to the Bible, ethicists, or others as valid and fair opinion was also balanced against what stayed closely to the topic. I eventually used literature which encompassed feminist and sociological perspective's. This was because both are concerned with understanding the context of women's lives, and have examined pregnancy as a special stage of a woman's life cycle. Feminist writers view with some criticism the reproductive choice movement as fitting within the privileged genetic medical expert definition of personhood. To complement the academic writing I have included literature from those with a deep understanding of the situation, from the parents who have chosen to experience an alternative to abortion, and finally a very personal view is presented from people born with obvious disability.

The predominantly feminine nature of midwifery practice makes it an obvious area for the application of Gilligan's (1982), study of moral decision making. In her research of women deciding about voluntary termination of pregnancy, she argued that there is a specifically feminine way or mode of moral development and ethical decision making. She believed this is distinct from the conceptual, rationalistic, supposedly 'objective' modes typically adopted by men. Women, she stated, reason in a different voice, this was because women's judgements were tied to feelings of empathy and compassion and are concerned with the resolution of real life as opposed to "hypothetical dilemmas".

Before reading the literature I considered my own understanding of the moral status of the fetus in regard to the "unsettling" issue of abortion. This was to establish where my thoughts fitted with the ethical justification for a public health policy in New Zealand which provided for a free abortion service. At present, British and New Zealand legislation give limited constitutional legal rights to embryos and fetuses
(Skegg 1984). It is permissible to conduct research on the embryo up until fourteen days from fertilisation. The fetus has no rights as a person under English law until the age of viability at twenty four weeks gestation (White 1994). The ethical implications of this are massive because we know that as early as twelve weeks a fetus looks very much like a miniature human being, and the mother can feel it moving from sixteen weeks. My own feelings are that the fetus has some moral status but not as much as adults. The fetus develops increasing moral status throughout the pregnancy and justification for abortion would have to become stronger with gestation. Early abortion would be justified in cases of rape or fetal abnormality if that was what the woman chose.

Poplawski and Gillett (1991) specifically examined the way that the human form existed in a longitudinal way, throughout the continuum of human growth and development. They argued in terms of a gradualist position which would provide a five month old fetus with greater protection, or rights, than a week old embryo. Over time embryos and fetuses would have an increasing potential for full personhood, therefore the development of moral worth or value was also part of a continuum. Even though the fetus did have moral weight there were certain circumstances during the continuum when the moral weight of the mother is greater. For instance this greater moral weight would be evident when the continuing pregnancy would pose a significant mental or physical health risk to the mother.

Prenatal diagnosis and the possibility of selective termination of affected pregnancies is part of a wider move towards reproductive choice. This is due in part to ultrasound technology. It is accepted that timely counselling is appropriate before prenatal screening and diagnostic tests are done. There is general agreement that amniocentesis, chorionic villus sampling and fetal blood sampling are prenatal diagnostic tests. Many people are not however fully aware that ultrasound scanning is the most powerful tool in the field of prenatal diagnostic tests. It is the investigation offered to the most women and the one that detects the most fetal abnormalities (Chitty et al. 1991). In my study two women, Beth and Emma, did undergo
termination for abnormalities found by ultrasound examination. They provide an emotional account of the effect this had on them. A third woman dropped out of the study after her ultrasound but before the interview. This was because a fetal abnormality was diagnosed by the ultrasound examination and the woman made a decision to have an abortion the next day.

Now, the more physically invasive the test is, the more risk it poses to the pregnancy and the more counselling the woman gets prior to the test. So one woman might have much counselling prior to a fetal blood sample, and another woman absolutely no counselling prior to an ultrasound scan. This takes into account a woman's right to decide whether or not to expose the pregnancy to the risk of a blood test. But this ignores a woman's right to decide whether or not she wants to have certain information from the ultrasound examination about her baby, even though this may in turn, result in her aborting a previously, much wanted fetus. Some concern has been expressed that ultrasound scans may be used capriciously in practice, for frankly ideological purposes, for social control. This is because termination of pregnancy currently dominates the management of a pregnancy when a fetal abnormality is found on ultrasound scan.

Claims that the use of antenatal 'scans' serve as a force for eugenic policy and the promotion of discriminatory attitudes towards handicap or disability is an extremely important viewpoint. As one would expect people with disabilities can see some similarities between the eugenic practices of the past, (Germany between 1933 - 1945), and the current situation. Examples of these similarities are explicitly included in the writings of Saxton (1987), and Waldschmidt (1992). Saxton wrote as a person with spina bifida, which she sees as the major target of antenatal screening and abortion. In commenting on the issues of antenatal scans, she said,

The assumptions I challenge include these: that having a disabled child is wholly undesirable; that the quality of life for people with disabilities is less than that for others; that we have the means to humanly decide whether some are better of never being born.
She asserted that the medical system wished to fix, cure, to control, reinforcing the ideal and the possibility of the "perfect baby".

It is unusual now to assist a woman birth a baby with an anomaly. Before the availability of ultrasound this was more common. The last time I cared for a woman who 'birthed' a baby with marked spina bifida was in 1977. This was a sad and complete shock to all of us at the time. I do recall the local community being very supportive and loving towards the whole family. It was obvious that the woman was really sad, shocked, that her baby had a problem which was going to make life more difficult. However she was not disappointed in her baby and took special pleasure in the perfectness of its plump limbs and beautiful face.

Waldschmidt (1992) stated, that on the surface things appear to be more humane, as eugenics are practised with the active participation of all the individuals concerned. It has shed its authoritarian roots to become democratic and eugenic practices have become redefined as a medical treatment of cure. However, she found the crucial difference to be that,

In present day society the norms which are defined as; employment, education, independence, mobility and aesthetics. The disabled have difficulties with this, because the disabled do not match up to the values of society, disability is thus equated with economic and social inferiority (Waldschmidt 1992, p.157).

In New Zealand people with disabilities, such as those present at birth, a birth injury or by disease, are speaking out from their own particular vantage point about how it feels knowing that "normal people" are working hard to detect and stop people like them from being born, (Martin 1995, p.11).

The counselling of people with disabilities, so that they will consent voluntarily not to reproduce themselves, is further evidence of society's requirement that everyone must function as smoothly as possible within the utopian idea of perfect health. Both Saxton and Waldschmidt share the view that they have no option but to oppose all
antenatal counselling and screening. This is because it is a matter of their rights to life, disabled people's right to life, and their own reproductive capabilities. The significance of these concerns was also examined by the health economists Mooney & Lange, (1993). Another perspective which they argued has also been overlooked is that some social values could be changed as a direct result of the introduction of screening programmes, for example, social attitudes both to the congenitally handicapped but also among the congenitally handicapped could be altered as a result of the existence of a screening programme. A society which has such a programme might be less ready to provide the same level of public support in the future as they have in the past for children born with a now 'avoidable handicap'. In contrast Green (1997) has said that respect for the autonomy of parental reproductive decision making should be the prevailing ethic of genetic counselling. Green describes a small but growing group of people who seek ante natal screening so that they can terminate a pregnancy if the fetus is unaffected by the condition that they themselves have. The reasoning is that they (the couple) feel more comfortable having a child just like themselves.

Other writers, for example, Hubbard (1987), Schei (1992), and Degener (1990), all cited society's presumed acceptance of eugenic ideology as fundamental to the widespread acceptance of antenatal screening programmes. Hubbard, believed that the antenatal screening of pregnancy confronts women with decisions and choices they would not normally have to make.

This in turn further confirms pregnancy as a medical event, the belief that disability is unmitigated disaster, that we would be better off if people with disabilities did not exist. This makes women feel that they owe it to themselves, their families, their future child and perhaps to society as a whole not to bring a child with special needs into the world. The eugenic ideology which now prevails in many developed countries finds its political and social expression in neglect of the needs and civil rights of people with disabilities. As a result, people who have disabilities confront arbitrary barriers to education and employment, and find it increasingly difficult to live ordinary lives. These very
observable kinds of difficulties make people feel that it would be impossible for them to raise a child with a disability. (Hubbard 1987, p.232).

In Norway a routine screening programme has been established and now 96.6% of women are offered a routine scan at 17 weeks. When women are offered a scan as part of routine antenatal care it becomes part of a screening programme. The woman's autonomy is strongly resisted, women must take it as a given that the offer is best for their future child so who could say no, given there can be no benefit to a normally formed baby and early birth and death for some foetuses, to accept scans then society must be willing to accept eugenic ideology (Schei 1992, p.19).

Degener, noted that the focus of society was on self-responsible, individual, economic and social interest, which must therefore equated to considering the disabled as inferior.

Ostensibly antenatal technologies enable women to decide whether or not to have a disabled child, but the choice is deceptive. That the birth of a disabled child would be a barrier to the happiness of the whole family (Degener 1990, p.87).

The question of prenatal diagnosis for Degener was a wider issue than eugenics. It was about the principle of individual freedom and equality as well as rights and ethics. A woman who continued with a pregnancy in the knowledge that the baby would have some form of disability is made to feel that this would be an economic burden to society.

A woman centred critique of antenatal technology, has drawn attention to how technology has the potential to influence and affect human relationships and alter people's capacities to fulfil their responsibilities and maintain moral integrity. The
ethical perspective about what is morally valuable to women is not being considered. A notable illustration of a woman centred examination of diagnostic technologies that takes this approach is Barbara Katz Rothman's (1988) study on the relationship between a woman and her fetus. She focused on the relationship of a woman to her fetus as the initial phase of the relationship of a mother to her child:

A diagnostic technology that pronounces judgement halfway through pregnancy makes extraordinary demands on women to separate themselves from the fetus within. Rather than moving from complete attachment through separation that only just begins at birth, this technology demands that we begin with separation and distancing. Only after acceptable judgment has been declared, only after the fetus is deemed worthy of keeping, is attachment to begin (Rothman, 1988, p.114).

Whitbeck, (1987), in particular had a concern that scans posed a risk towards influencing human relationships, and have the capacity to interfere with the responsibilities women have to fulfil as mothers.

the market model for health care resources occurs when the high costs for new medical technology, such as scans, can be justified only because of its use, 100% of the time. This is when pregnant women come to be seen as a huge potential non-exhaustive market, and clinical material, (Whitbeck 1987, pp54-55).

These issues and other important features about the use of antenatal technology have been identified by Patychuck (1985, p.28) when she said that

Scans exploit women's desire to have a healthy child. Scans may drive a wedge between women and their future children. Medical technologies serve research and the status of medicine, when the fetus is judged "normal" by medical standards. As science now has the ability to discredit women's experience of pregnancy this can also be viewed as a subtle attack on women's rights. Medicines focus on the obscure, the new and fascinating mean that very few resources have
gone into evaluating the emotional effects that false positive or false negative scan results, may have, on women and their families.

Dallaire et al. (1995), studied how parents coped with the diagnosis of fetal disease or defect when this had been detected by routine ultrasound and compared them to parents who knew they were at high risk of giving birth to a child with a disease or defect. The study found that the group who had no prior preparation or counselling, the routine scan group, suffered more from shock and denial at the time of diagnosis. They also experienced feelings of guilt when they later chose to terminate the pregnancy. One-third of women in both groups felt obliged to undergo a therapeutic abortion.

Sandelowski and Jones (1996), conducted an interview study with fifteen women who had learned of their babies impairments following prenatal testing. They observed that

For many of these couples prenatal testing including ultrasound was seen to be a test to confirm that everything was all right with baby. The ultrasound was an activity of pregnancy to be "checked off", like buying items on a shopping list, or a simple "ritual of reassurance". Women suggested that they were often "backed into" as opposed to having actively chosen or refused tests. The choices offered because of the existence of these tests were viewed by many couples as burdens (Sandelowski and Jones 1996, p.359).

The authors questioned what assistance there was for couples to aid in psychological recovery from the event, and in the case of couples continuing pregnancies, for optimum parent child relationships. Reed (1996) listed parental adjustment to fetal anomaly as a very strong reason to provide routine examinations. Although abortion has been seen by many as the most obvious response to the diagnosis of a malformed fetus, it is not the only one, as parents of affected children are now making known. Women have expressed pleasure at having the information in
time to allow for emotional adjustment and to avoid the acute psychological trauma
accompanying the birth of an unexpectedly malformed baby (Wilson, 1993) and (Smith
1995). For some women to continue a pregnancy in which the fetus is not viable may
be less traumatic than choosing an abortion. One woman who was advised by her
obstetrician to terminate a pregnancy because the baby was anencephalic decided,
with her husband, to give the baby all the love and support they could even though
they knew it would die soon after birth. The geneticist later commented to the GP.

I was most interested to find that your patient is much more
emotionally intact three months later than the majority of women I
have seen who have undergone a later termination on genetic grounds.
I found it most instructive to learn that the mother still found the

Robert Martin (1995) who has spent most of his formative years in institutions,
has progressed to being the Self Advocacy Coordinator for the Intellectual Handicap
Council (IHC) of New Zealand. Martin wrote about technology that allows parents
to select the type of child they want. He believed that there is a place for everyone in
spite of abilities or disabilities. He is fearful of technologies that could be used to
eliminate from our communities people who are considered not perfect or different,
people like himself and his friends (Martin 1995). Involvement in self advocacy for
people with intellectual handicap is a new phenomenon in New Zealand. Grasping the
huge dimensions of issues raised by Martin, and then working through how they fit in
with a woman's right to terminate a fetus with an abnormality is complex.

**Summary**

Mothers and midwives face complex maternal and fetal rights conflicts, for
reasons which are now obviously not going to go away. By asking pregnant women
how they judge moral issues I may be able to find an authentic response. This could
in turn help midwives in coming to grips with this vital part of that care for women.
Ultrasound and technological control

Understanding the influence of technology on pregnant women is of importance to midwives. It is important because of the influence ultrasound technology has upon midwifery practice. Ultrasound technology continues to evolve and advance very rapidly. That ultrasound has the ability and power to control or influence social arrangements is very significant for midwives. Technology has several layers of meaning that midwives need to recognise. At its most basic, technology is a simple physical tool, manipulated to obtain a particular end, in this instance an image of a fetus. Technology is also part of a complex set of human activities in which we try to rationally transcend the simple physical tool in order to understand the outcome of the technology.

The social outcome of technological development affects all aspects of our awareness and experience. The speed of development has left us little time in which to consider if there is any outcome that would benefit from moral or ethical debate. Literature which attempts to put medical technology within the wider context of social and political debate has been led mainly by writers outside of the health profession. Issues about the power relationship of medicine to society and the way this developed unconsciously and unintentionally has been described at length by Foucault, (1973). Foucault described this issue of social control by medicine as "the-disease-treatment discourse". Discourses are about the issue of power and knowledge, and the way they gain prevalence in society. Foucault believed that medical discourses which combine truth and power, are a result of the "clinical gaze". Ultrasound technology has therefore provided health professionals with possibly the ultimate aspect of this clinical gaze. The term "clinical gaze" was used by Foucault, to refer to the way in which medicine came to understand the workings of the body. In his writings he mentioned the discovery of such diverse things as the stethoscope and the coincidental discovery of pathology.
In his work, *The Birth of The Clinic*, (1973) Foucault drew attention to a particular type of control that emerged in society by the end of the eighteenth century. The body became increasingly something that medicine had greater access to and surveillance over, and from which it developed a greater knowledge base. But this knowledge was constructed within certain narrow guidelines relating to pregnancy and childbirth. In keeping with Foucault's analysis, medical knowledge and skills have come to be regarded by society as superior to the knowledge that women may have intuitively about themselves, or to the skills that professionals, for instance midwives, who use less technology, may have. A similar view was shared by Illich (1975), who asserted that the medical profession have deceived the public into believing in the power of its own body of knowledge and skills. He states that this in turn has created a false dependency on medical technology. The result was a mistaken belief by society, that there must be a medical technological answer for all forms of disability or disease.

The use of power to create, define and control illness by medicine was argued by Freidson (1972), who stated that professional dominance was done by the use of authority, derived from claims of competence, based on the scientific technological basis of medicine. In writing about technology creating power, Mazzeo (1987) the historian, also suggested that there was an intimate relationship between technology and political power and that for each advance in technology there was a corresponding increase in technological power.

There are always benefits and dangers in technology because the results of technology can be used in all sorts of ways, the results are not neutral or value-free. Furthermore each technological advance increases power over natural forces by whom ever owns that technology. The uses of this power, where it goes and who exerts it, is fundamentally and finally a political problem. With each advance, we must ask ours; who will wield this power? for whose benefit? The answers are not always encouraging. (Mazzeo 1987, p.214).
Issues about the inappropriate use of science, and technology and their relationship to control and power have been highlighted by Cassell (1993). Cassell likened technology to the broom in "The Sorcerers Apprentice". In other words technology has come to have a life all of its own. In making this point he described how "power does not reside in health professionals as individuals alone, but also by virtue of their acknowledged place in society" (Cassell, 1993, p.33).

Medical technology, because it epitomises twentieth century scientific medicine, as understood by society at large, greatly extends the ability to reinforce and sanction medically defined social roles and norms. Also of importance to Cassell was the power that the use of technology conferred on both health professionals and health institutions. He described how doctors responded and felt differently when examining a patient compared to examining an image on a screen. He claimed that doctors now accept technologies as the equivalent to the patient being tested. Therefore, it was not necessary to find out how the information fitted with what the patient may know or fear.

Norms within society which may place a negative value on babies with certain congenital conditions may be reinforced by medical control as is evident in the paper Public Health Policy Advice To Government (Eastwood, 1993). The prevention of congenital and inherited disorders was one of six pilot health goals presented to the government in this paper by the then Public Health Commission. The stated goals of the paper was to increase reproductive choices by enabling couples to make informed choice and by reducing the impact of birth defects on families and the community. Of importance to my study is the statement in this paper.

The health, education and social cost borne by the community as a result of birth defects such as Downs syndrome and spina bifida, are substantial. Modern scientific knowledge and diagnostic techniques can now prevent many serious birth defects at a cost to the community which approximates the amount expended on the care of an affected individual for just one year Eastwood (1993, p.1).
One of the tools that was suggested in this paper to help with the prevention of birth defects was increasing the use of ultrasound examinations from selected clinical indications to use as a screening tool for low risk younger women. This was because two-thirds of all Down syndrome affected babies are born to women younger than 35 years. Included in the paper is the importance of consumer support groups for people who continue to be born with birth defects and these groups should be encouraged by Regional Health Authorities (RHAs).

Summary

My observation of medical students adds to what Illich (1975) and others have described. I observed a number of students during their medical education who were led to believe that technological control could save us all from the errors and tragedies of biology. Students felt and expressed a great sense of personal and professional failure when a pregnancy did not end with a live, completely normal baby. A recommendation that all technology assessment should be multi-disciplinary and involve all types of providers who use the technology, was made by the World Health Organisation. The importance of including the women, on whom the technology was to be used, in planning and evaluating the results was stressed at the Joint Interregional Conference for Birth held in 1985, published in Midwifery Digest (1991). Social and political considerations about the influence, role and outcomes of ultrasound technology must be understood from the perspective of women's lived experience of pregnancy. This is explored in the last section of the study.
Methods, rationale and choice of research design.

The study proposed to examine and expected to answer the question "What is women's subjective experience of ultrasound scanning during pregnancy?" To do this, women had to be asked about their experiences, and their answers recorded. Due to the complex nature of this question it needed to be approached from more than one angle. In this study data collection was planned to be conducted by personal interviews seeking qualitative data to complement, enhance, and expand on questions asked using a structured questionnaire. The multiple approach to data collection and data analysis in a single study has been referred to as triangulation (Goodwin and Goodwin, 1984).

Whilst women's experiences with ultrasound have been studied overseas, it has not been the subject of research projects in New Zealand, therefore the present research is designed to 'fit' New Zealand and in particular Otago. This situation required a study of a more descriptive exploratory nature. The concern was to pay attention to the context in which the scan was occurring and to understand the meaning and implications this had for a wide group of women. With no hypothesis to prove, my goal was to 'illustrate' the experience. A major use of the findings could be to assist health care professionals reflect on what women want from this aspect of antenatal care. As Mooney and Lange (1993 p.873). point out in their paper about antenatal care, "what constitutes economic benefit to society as a whole should always include considerations about what it is that women want from being screened".

New Zealand midwives have thought of midwifery as a "partnership" of equals, between the woman and the midwife. Midwifery research has thus to comply with this stance. The Midwifery Handbook For Standards of Practice, (1993) incorporates that part of the code of ethics which relate to research. Sleep (1992), a lecturer in midwifery research, found that the kinds of factors and problems exposed by other researchers could be transposed into the midwifery setting. She argued that because
of this, midwives could realistically and usefully incorporate appropriate research techniques from other disciplines. The methodology in feminist sociological research shows a strong concern for ethical implications of research. They attend with caution to the linkages between the researcher and researched. The strategies which are used to avoid the traditional domination and subordination inherent in research, is also described in the work of Cook & Fonow, (1986). This is an approach which fits well within the New Zealand National Standards for ethical research that intends to advance the philosophy of partnership.

Midwifery research beyond New Zealand shows a move towards the methodology used frequently within the discipline of sociology. Sociological research is useful because ethical research needs to be grounded in practice. Thus the effective study of relevant moral concerns is better not detached from abstract ethical theories. There are however, other controversial hypotheses on the relationship between researcher and informant in qualitative research. Wilde (1992), cited the conflict that arises during the interview setting between being supportive in dealing with the respondent's feelings and memories, while trying to avoid influencing the respondent or revealing one's own perspective. Wilde said "that this conflict is especially difficult for researchers in the caring professions, such as midwifery".

For research to produce credible findings, the data must be collected in a consistent, reliable way, and must be a valid indication of reality as experienced by the participants (Goodwin and Goodwin, 1984). Some researchers find that to achieve this they must follow one single research strategy, which they believe represents their paradigmatic perspective. A useful definition of paradigm in this situation would be Kuhn's, (1970) "a world view or set of assumptions and perspectives that provide a conceptual framework for the organised study of the real world". I have difficulty with the idea that there is only one best way to do research. Trying rigidly to link paradigm with method is limiting and can deny one the best features and strengths of many types of methodologies. Previous research I have conducted using only quantitative methodology failed to show the whole truth of a situation, which was a
disappointment. "Most research studies can benefit from multiple measurement strategies" (Goodwin and Goodwin 1984, p.379).

Methodological strategies that could enhance efforts to collect, conceptualise and describe the complexity of women's response to scans was needed. By combining both approaches it is intended to achieve a greater degree of comprehensiveness. The advantages of combining or integrating two methods of research in a single study have been detailed by Filstead, (1982) and Bogdan and Biklen (1982).

**Across Method Triangulation.**

Methodological triangulation was accomplished in this study with the "across different paradigms method" (Mitchell 1986, p.21). Two opposing approaches which have evolved from seemingly different scientific paradigms and philosophies are termed qualitative or quantitative methods of research. Because different types of knowledge are revealed by quantitative and qualitative paradigms, combining them may lead to a expanded understanding of the issues under study (Denzin, 1978, Goodwin and Goodwin 1984, Hinds and Young 1987, Mitchell, 1986, and Sandelwoski 1986).

Quantitative research strives for objectivity and gives restricted, specific information, often straightforward numerical statistical data its aims are to produce reliable and valid data using context-free, rigorous and repeatable techniques, and it is generally hypothesis testing and predictive. The strength of the scientific research method is in reductionism - in its ability to reduce and refine a phenomenon so that it can precisely and scrupulously define the variable under study. The weakness is also reductionism-refining and reducing the variable, stripping it of contextual meaning, and moving it further and further from the whole, from holistic meaning of a lived situation (Tinkle and Beaton 1983, p.27).
Kaptchuk & Croucher (1986), described quantitative research as a scientific method which reduce, quantify, and measure exactly to allow generalisations across populations, but only generalisations about narrowly defined features of a situation. While at the same time it would cancel out particular contexts, their peculiarities and individual features.

Qualitative data, on the other hand, reveals rich, broad, subjective information confined to the study at hand because each experience is unique. It is exploratory and hypothesis generating. Qualitative information expands and amplifies the variable under study, giving depth and breadth. Rather than aiming to be value free it acknowledges the role of the values of the researcher. Because qualitative research is context-rich it can augment meaning by locating experience in the actual setting. In recent years some authors such as Goodwin and Goodwin (1984), Hinds and Young (1987), Mitchell (1986), and Sandelwoski (1986), have suggested that these two approaches are not so dissimilar as previously thought but are complementary methods of research, each contributing its own type of knowledge to the research process. These authors propose that mixing qualitative and quantitative methodologies in one single study will "tend to correct, clarify, expand, and stimulate each other and triangulate into truth" (Hinds & Young 1987, p.195). As qualitative analysis focuses on understanding the meaning of a scan from the women's subjective experience, the careful combination of qualitative and quantitative research should strengthen the quality and validity of the present study.

Multiple triangulation in an integrated research design is also called convergent validity where the aim is to give a complementary view or picture of the issue being studied. Kuhn (1970) has suggested that quantitative and qualitative paradigms alone were incomplete because each was blind to certain information. However, each method has "unique strengths and weaknesses" (Denzin 1978, p.309). Combining and overlapping the two contributes to convergent representation of the whole conceptual domain, thus cross-validating the findings was suggested by Denzin (1978) and
Goodwin and Goodwin (1984). Recognising and convinced of the philosophy that using multiple techniques gives a true, more meaningful, and more holistic conception of the issue being studied, a triangulation of qualitative and quantitative method of data collection and analysis was chosen to act multi-dimensionally in this study. Data collection methods suited to each paradigm were blended in multiple triangulation fashion. Structured, but open-ended interviews produced data that was able to be analysed quantitatively and qualitatively.

**Problems of multiple triangulation**

Problems faced by this researcher were similar to those discussed by Mitchell (1986). This study by necessity was small, conducted by a single researcher limited by both resources and time. The demands of knowledge and ability to work with and blend both paradigms was a further difficulty. Because it was necessary to understand the scan through the woman's experience as the prime concern of the study, this report places emphasis on qualitative accounts when reporting the research. Women in this study were asked about their health status, level of education, number of previous pregnancies, and number of live children. As well as this I asked about their marital status and educational level. The answers to these questions assisted in establishing a general knowledge about women being scanned in Otago.

**Sampling and selection of participants**

"When obtaining a sample the researcher selects participants according to the needs of the study" (Bogdan and Bilkin 1982, p. 67.) My need was for women who were pregnant and intended to undergo, or had undergone, the experience of a scan. Therefore, the sample was by definition representative of the phenomenon of interest. However, to increase diversity of the sample I "purposefully" recruited women attending private and public maternity services. This ensured I interviewed women based on typical population characteristics such as age, economic status and level of
education. Thus the sample used was a volunteer or solicited sample representative of the wider population of women but not a randomly selected sample (Morse, 1991). The actual sample size was based in part on other research studies of a similar nature but limited by time and resources and so could be classed as an "educated guess". Many benefits of a small sample size have been recognised by other researchers.

When selecting a small sample of great diversity, the data collection and analysis will yield two kinds of findings: (1) high-quality, detailed descriptions of individual cases, which are useful for documenting uniqueness, and (2) important shared patterns that cut across cases and derive their significance from having emerged out of heterogeneity (Patton 1990, p172).

**Interview technique, concerns and challenges**

Interviewing by using open ended questions maximises discovery and description, and offers researchers access to people's ideas, thoughts and memories in their own words. Interactive interviewing was the mode of data collection for this research study. A number of social scientists have comprehensibly and thoroughly researched the process involved in interview techniques. Although there seemed to be no single rigid method to follow when interacting with the women in the study, the writers have, unanimously, made strong recommendations as an ethical stance, on how to try to equalise the power imbalance between researcher and researched. The process they have described is broadly defined as one of a "human relationship model". This model has helped guide the way I developed my study. Excellent examples of these recommendations were found in the writings of social scientists such as Oakley, (1988), Stacey (1991), Finch, (1984) and Mc Robbie, (1982). Nurse researchers also have articulated similar ethical concerns when advocating an interview approach as a method of research (Smith, 1992). Qualitative methods are not new, they have been utilised by a number of researchers in a health care setting when recording the experiences and emotions of individual women. Examples include Denny, (1993), Hall, (1993), Smith, (1992), Sandelowski, (1986) and Rothman, (1988).
Oakley (1988) has discussed methodological problems highlighted by her research on motherhood, and in particular the gap that existed at that time between textbook recipes for interviewing and her own experience as an interviewer. Oakley critiqued the more traditional masculine objective criteria for interviewing, saying that it created problems for interviewers whose primary orientation was towards the validation of women's subjective experiences. She suggested that as women obviously already knew how to utilise women's unique communication patterns, they needed to ask themselves at the outset, "how can I prevent abusing this relationship and equalise the power imbalance inherent between researcher and researched" (Oakley 1988 p.99).

Other writers such as Stacey (1991) have suggested that there are even more contradictions than those Oakley discusses. Stacey argues that in the "real world" the researcher is commonly perceived as more important than the women being interviewed. Added to this are the known divisions of class and gender.

Therefore, maintaining that by replacing traditional masculine interviewing techniques with a perhaps more "sisterly" style is in many ways a fraud. Indeed it may be even a more dangerous form of exploitation (Stacey 1991, p.112).

My perception was that our relationship at the time of interview was one of equals. I was dependent on the women to complete the study and they were given an opportunity to have their opinions recorded. As I had never experienced a scan the women always knew more about the procedure than I did, but conversely I often knew more about what the results of the procedure meant. There was a fair exchange of information between us. Stacey (1991) was firm in her belief that at the end of the day the researcher always departed with her data, with which to further her career, and the researched stay behind, usually no better off than before. She believed the documented willingness of women to talk to researchers was indeed often another index of their perceived powerlessness in the situation, a situation we must be
mindful not to exploit. Finch (1984, p. 74) believed

Women often expose themselves and their lives in a way that leaves them open to exploitation by researchers. She speculates as to why women might behave this way. Firstly women are often put in the position of providing professionals with information in connection with childbirth, children and school. Consequently to do so in a research interview might not be so unfamiliar. Secondly, interviews conducted in the home with an easy informality including coffee or tea, may take on the air of a friendly chat encouraging an unwarranted intimacy. Finally, she asserts that women who spend much of their time at home may welcome the opportunity to talk.

This view misses a major point, as women can benefit enormously from the informal education that often takes place during research. Moreover, often unresolved worries can be aired and dealt with. Stacey (1991) and Finch (1984) tend to represent women as pathetically passive and exploited, but this is not my experience.

A further dimension to ethical interviewing is described by Mc Robbie (1982). She explained that the very questions we ask are always informed by the historical moment we inhabit, ie research is historically located. Therefore the terms within which I as a midwife set up a study will most likely reflect, among other things, the current level of debate and argument within the midwifery profession and women's groups. If, as I do, believe that the women herself is the central person in the process of the study I need to ensure I treat my "subjects" with respect. In response to Mc Robbie's statement about respect I invited all the women to telephone me if at any time they had any other issues about ultrasound technology with which I could assist. In the event none of the women phoned me with any issues related to their examinations.

Another ethical problem could arise when women disclose more about themselves than would normally be the case. This has been identified specifically as a
problem in the practise of conducting the research in women's own homes (Smith 1992). Smith (1992 p.101) cited many examples that she classed as ethical issues in interviewing. While she agreed that there is now substantial literature available about how to conduct ethical research, she said that this required that ethical interviewing must begin with the interviewer. In the context of health care a careful balance has to be sought which facilitates interaction but also maintains objectivity. She stressed that the interviewer's role was always one of investigation, Smith sums this up when she says.

She is not in the women's home to counsel, educate, sympathise exploit or organise. However, as an "interested" outsider, one could listen and note problems, this is the only tenable position, ethically.

Partridge & Barnett (1986) have a more pragmatic approach to the problems highlighted by other researchers although they acknowledge and identify similar issues. Even so they judge an interview survey to be a proven and useful method of research. They define the interview as an intellectual function, "a conversation with a purpose" (Partridge and Barnett, 1986, p63)

One technique of content analysis was described by Carney, as the best method of analysis for open ended questions used in written text. Carney considered the three main purposes for using this technique, were

One when the source material is complex and/or voluminous. Two facilitating inference, or comparing characteristics from individual text. Three moving the data-gatherer from seeking proof of their own views to that of simply conducting an investigation. The outlook which goes with content analysis is, I wonder what actually is in the text. (Carney 1972, p.5).

Content analysis then seems to be an analytical structure which will enable the researcher to reach certain conclusions from written text. It seems to provide a means
of being objective and systematic when dealing with large amounts of data. The accepted definition of content analysis is, 'any technique for making inferences by objectively and systematically identifying specified characteristics of messages'.

**Reliability and validity of research methodology in general**

When constructing a measurement instrument such as a questionnaire, major issues are involved in establishing the validity and reliability. Reliability alludes to the stability and constancy of a measuring instrument and the extent to which repetition yields similar data. It also refers to the extent to which a measure will produce equivalent information when administered by different people (Diers, 1979). Reliability is also a measure of accuracy - the internal consistency - of the attribute to be investigated (Polit and Hunger, 1983).

The questionnaire was designed and constructed for this study therefore no previous testing of the external reliability has occurred. The consistency achieved amongst participants in the study was by a uniform method of interviewing and a clear and common understanding amongst the participants of the nature of the study. Thus internal reliability was achieved. That is, the questionnaire produced similar results between individual participants. External reliability can only be established by the same study being replicated to discover if similar results are obtained or by the different administration of the same questions. However, this was not feasible in the present study. Validity refers to what the test appears to measure - whether it "looks" valid. Does the test appear to relate directly to the purpose that has been explained, in this case to the women in the study? Because the range of questions in the survey reasonably covered most aspects of the experience of the ultrasound examination, it can be seen that content validity was also achieved.
Validity and reliability in qualitative research

Validity and reliability are concerns of all qualitative researchers, "as equally as is rigour it presents such faithful descriptions or interpretations of a human experience that people having that experience would immediately recognise it from those descriptions or interpretations as their own" (Brink 1989, p.121).

"A study is also credible when other people can recognise the experience when confronted with it after having only read about it in the study" (Sandelowski, 1986, p.30).

Paying attention to the basic issues of validity and reliability will increase the credibility of the findings or results of the study. Quantitatively, validity and reliability should be addressed when designing the study and must be built into the research design. Whilst agreeing with this statement, it must also be recognised that validity and reliability are always shown by data analysis in qualitative research. Ensuring the study can measure the critical questions is also a question of validity (Diers 1979, Polit and Hungler, 1983). Face validity was established for this questionnaire by review and multiple instances of consultation during the development.

Qualitative analysis

Qualitative analysis took place in this study by a process of content analysis described by Carney (1972). The purpose of the analysis was to discover - what was happening? what was important? These questions were answered by performing pattern matching and in some instances frequency counts of words related to the subject matter. Analysis began by my becoming very familiar with the data by reading and re-reading and then finding descriptive expressions, themes, similarities and differences and using descriptive and illustrative quotes to support the developing
ideas and findings from the literature.

Analysis of the data was conducted alone, but was supervised and checked by the thesis supervisor. The type of research most criticised for being at risk of failing in validity and reliability is the single, one-shot, open-ended, semi-structured questionnaire administered to a convenience sample. This was the type of study I conducted. This study sought to have a method of verification with a percentage of the women. Four women agreed to read my drafts of the work as it became available. In this way they were able to see and say if my interpretations were truly representative of what they had said. Validity of the data was further enhanced by returning the findings to these four study participants for confirmation. The interview was interactive, and contained both open and closed questions. The volunteer sample of forty-one women is representative of the wider population of women experiencing a scan. Problems that I have not been able to control may include such things as, current domestic relationships, tensions and historical wariness of 'authority' (however well that is concealed), but I have no specific reason to suspect they will distort the data. One way to overcome this could be to enlarge the sample.
Conducting the study

Drawing on my own work experience I developed a set of closed and open-ended questions. The closed questions encompassed the demographic and health facts about each woman including information about her present pregnancy. The open ended questions probed such areas as; informed consent; the women's description of the scan examination; women's understanding of how the scan results may change their future health care. The Professor and Director of Radiology kindly read my questionnaire and I also received a great deal of helpful advice on the language and sequence of the questions from other health researchers. Advice was given to me from both midwifery colleagues and obstetricians. Following some months of informal pilot testing of the questionnaire on friends who were pregnant my submission was ready for ethical approval. My first submission to the then Otago Area Health Board Ethics Office was at the March meeting (1993).

Problems and benefits with the questionnaire

This survey suffered the same difficulties as all surveys in that it tends to be too simplistic; ie answers will always depend on how women are feeling at the moment. This gives no indication of how feelings may change over time. The benefits were that by using face to face interviews there was every opportunity to seek clarification, and there was no risk of questions being accidentally missed. This method lends itself well to the exploratory nature of the study.

Ethics committee approval

The committee made a number of suggestions. One major fundamental change was that I should attend with the women at the time of the scan examination. The survey would then comprise of three parts. The information before the scan, my observation of how the scan was conducted and the post scan questions. I followed up this suggestion and approached the public and private facilities for permission to attend with the women. At that time I made it clear that I would only be there in
attendance if each woman gave permission, moreover, that my presence would not be obtrusive or get in the way of the examination. In the event I did not attend to observe many of the scan procedures. This was because, for different reasons gaining access to two of the four clinics was a problem. One private obstetrician and one of the rural clinics gave permission for me to attend, provided the women had first given me permission. In fact the staff at the rural clinic welcomed my presence and continued to be interested in the study's progress.

Other suggestions made by the Ethics Committee included some small changes in the wording of the questionnaire and a reduction in sample size from my original plan of two hundred women. Their suggestions were incorporated in a revised study protocol. I also included with the next draft of the research protocol a copy of my proposed consent form and the information sheet (Appendix D). The study was considered and approved at the August 1993 meeting. Unfortunately, due to the pressure of my other studies and full time work, I did not start circulating my information sheets until January 1994. The first woman made contact with me in February 1994.

The sample

I wanted to have a representative sample of women, "to spread my net wide" and not to have only women who were classed as either high or low risk groups or from one social group or geographic location. While it would have been possible to obtain the sample through the hospital clinics I wanted to recruit women who would have wide and differing experiences of scans. To achieve this I spoke with consumers, midwives and doctors about the study. They agreed to my placing notices in their clinics, requesting that women contact me. These groups of people also agreed to display copies of the information sheet where it would be noticed and collected by pregnant women. I put a total of one hundred and forty five information sheets in eleven different locations (Appendix E). The information sheet was printed in English only as I felt that actively recruiting women of non-English speaking backgrounds was
probably another study in its own right. I did not have the expertise nor the resources to satisfactorily deal with that type of study.

**Participants**

Thirty eight women contacted me after reading the information sheet. This was to find out more about the study and my intentions, before deciding whether or not to participate in this research. Five other women had requested that their midwife give their telephone number to me. These women wanted to be in the study but were reluctant to call me, as one women said, "I wanted to take part in the survey, but I don't have a lot to say, just think scans are great", and another "my scan was a bit of a mixed blessing, you might be too busy to hear that". When I called the five women whose telephone numbers I had been given I first said who I was and how I had obtained their telephone number. I then checked with each woman that she had understood the information and that she was indeed happy to participate. A few women said they wanted to be in the study to "contribute to science".

**Arranging the interview**

The interviews were to be formal, in that they were prearranged. Further, the interview was planned to be done on a one-time basis, with only one participant at a time. To facilitate this each interview was arranged by telephone. I spoke with all the women about myself, outlining my intent and the content of the survey questionnaire, indicating the possible time commitment that would be required of them. Appointments were made at a time and place convenient to the women. I requested that the women think about having the opportunity to talk privately without partners, older children, or neighbours present. The consent form the women read and signed made explicit that the interview covered the participants subjective experience of having a scan during pregnancy.
Self disclosure

I was asked by a number of women about the research project and my personal investment. I did tell all the women that I was the mother of two children born when scans were not so freely available, and therefore I had no personal experience of scans.

Participants lost to the study

Two women were subsequently lost to the study. One because she decided to cancel her scan appointment, and was therefore ineligible. The second, whose appointment with me was for the same day as her scan, declined to be in the study. This was because a fetal abnormality diagnosed on scan, resulted in her decision to terminate the pregnancy. She decided that she could not cope with the added stress of the interview.

Place of ultrasound examination

Dunedin has four facilities where women have an ultrasound examination. These are: the radiology rooms and maternity centre at the public hospital; private radiology facilities; and one of Dunedin's obstetricians provides a scan along with the provision of other antenatal services. Women attending for the examination in rural locations were examined at the local public hospitals. There were reports of a visiting specialist "doing the rounds" of all the rural hospitals. These reports came from the rural women who participated in the study, although none had had an examination in this way in this study.

Confidentiality

Except when women have themselves told others of their own participation in the study I am the only person with the knowledge of the identities of those who eventually participated. Occasionally the women's partner or another adult arrived but were encouraged to leave and we continued with the interview. I have the signed
consent forms and original survey forms. My supervisor has access to the typed transcripts. Each women has been given a new non-identifying name. Children's names and those of partners are also changed. On completion of the study I will send to the participants a copy of the study summarising the main points. On receiving a copy of the study report, women may recognise themselves by "their own words". This will be particularly so if they can recall what they said or if they held very strong or unique attitudes about some of the issues. I note that even with the identifying status of the women removed, just reading through small segments of the transcripts allows me to recall most of the women and the interview circumstances. The four women who have assisted with study verification have access only to their own questionnaire. I do not believe anyone could identify the women from my research study.

Time frame

My planned time frame for contacting, recruiting and interviewing was to be from February until August 1994. I completely underestimated how dependent I was on being at home when women phoned and then finding mutually convenient times and venues to meet. At the end of 1994 I had completed only twenty three interviews. Furthermore as the year wore on and social change was evident with the continuing debate about charges for health care, some of the women were asking me about the possibility of having to pay for scans. There was also some discussion in the media, about the manner in which this technology was being used in other countries, in particular India, to bring about the abortion of huge numbers of female fetuses. As these two topics were of interest to some of the women in relation to having a scan in New Zealand I wrote again to the ethics committee asking if I could formally include these two extra concerns in the survey. Permission to do this was granted in early January 1995, along with suggestions for wording these additional questions.

Once I had this written permission I contacted the women already surveyed, explaining that I was asking them to "over the phone" answer the extra questions.
First of all I read out each question and then asked if they were happy to respond. As a result of this second later contact I have more information, about subsequent scans and in some cases the birth experience as well, than what was originally sought. Two women were unable to be contacted, and so a (no response) is entered for the extra questions on their survey forms. The remainder of the women who were still to be recruited into the study had the additional questions, about costs and rights, incorporated into the study as the new, last page of the questionnaire.

**The interview**

For the first few interviews I had a sense of trepidation. I am aware how I feel sometimes when people make demands on my time which I feel are unnecessary. Then I was encouraged by the fact that the women responded in a way that indicated that this was useful research. At the beginning of each interview I explained that the questions commenced with the "facts" ie, information about who they were, age and educational level before moving to health status and pregnancy. The "facts" make up a large part of the quantitative component of the study. Then I asked women to recall the scan examination itself and think about the implications a scan may have had for them. I also stressed that the participant was not compelled to answer any of the questions if she would rather not. I also explained that it was not a quiz, there were no right or wrong responses, only their own answers. I further explained that the answers they gave should be a reflection of their own experiences which in turn would be described as the facts or feelings as they knew them.

My instrument of investigation was the paper survey form, with set questions of a closed and open nature. I had expected all the women to complete the pages for themselves as this is what had happened on the dry run with my friends when I was piloting the survey. At that time I had sat quietly by, ready to clarify or respond if the form was not as clear as I had intended to be, but this only happened at about half of the interviews. Typically what happened if the women had small children was that the interview took place in the women's own home usually in the kitchen or living areas.
The woman read the survey form asking some questions of me as she went. There was every opportunity for women to seek clarification of the questions.

There were unavoidable interruptions during some interviews, which in themselves are a valuable reflection of reality. In some instances the women spoke and I wrote, practically verbatim, what they said. This happened when young children were present and wanted mother's attention or with a couple of women who were busy breastfeeding another baby. In these instances I asked the women to re-read the form before I left. In this way she verified that what I wrote was actually what she had said, and more importantly what she meant. Interviews in the women's home took the longest time, lasting about one and a half to two hours, mainly because of the children's frequent interruptions. In some cases I interviewed in coffee shops. This was mainly to meet the needs of the women from out of town who met me after the scan but before driving back home. Three women were interviewed at their place of work. No matter where the interviews took place all the women were generous in the time they shared with me.

Role conflict

There were a few occasions when I did feel a dilemma over being supportive and dealing with women's sadder and deeper feelings brought about by memories during the interview. One woman in particular was very tearful as she revealed to me a passed abortion that until that time she had shared with no one except the baby's father. What she was saying was very important to the research because her memory of this event certainly did affect how she experienced the scan this time around and so I asked her permission to write down her words. She gave me permission for this and I completed writing the form as she spoke. At the time I felt I should be doing more then just collecting my data but neither did I want to lose this important information. On completion of the study I sat with her for some time to listen to her anxieties and provided a supportive role.
Sometimes I wore my clinical midwifery hat, when women asked me direct questions regarding pregnancy or childbirth questions to which I could reasonably respond. This related most commonly to the different effect on labour between breech and cephalic presentations and to the ability to establish breastfeeding following caesarean births. On these occasions I stressed that my answers were purely textbook answers. I recommended they ask their lead health professional those same questions, in relation to their situation at the next opportunity, citing professional etiquette as a reason for my not discussing issues outside of the study proper.

Two women asked if they could choose me as their midwife and this was a very flattering thing to happen. Furthermore, this was an issue that I was not prepared for. In the event it did seem as though this could be later construed as soliciting, even though in my own mind I was clear this was not what had happened. I told the women that it would be inappropriate for me to become their midwife under the circumstances. On these two occasions I was mindful of Mc Robbie (1982) who said that the historical moment always informs the topic and interest.

Truthfulness

There was no necessity for deception of any kind. My intent was to record women's subjective experiences of a scan examination. I have assumed each woman spoke the truth as she experienced it. That is, I did not see any women having anything to gain from responding in any particular way. I have accepted what the women said as valid, with their responses standing as a legitimate representation of their experiences. Thus I believe that the study met Diers (1979) criteria for reliability. Another researcher using the same questionnaire could produce similar information.

I have been involved in research that constrained my response to ticking in boxes, I felt this never allowed me to truthfully answer the question. In the present
study women were not restricted by the layout of the form. In many cases responses covered the back of pages and extra sheets of writing paper. Other women had only a few brief comments to make. The question about fetal rights, perhaps the most personal and sensitive of all the questions, was either answered very fully or not at all. I admit to feeling a reluctance to use probing questions in this highly sensitive area when I witnessed the women omitting this question and moving on to the next. I thought there proved to be a fine line between accomplishing my research goal and maintaining the position of the women being in charge of the questionnaire.

**Rapport**

Because an interview is an interpersonal encounter, it is vastly improved by mutual understanding, rapport, and trust. “Similarity of background and personal attributes can be beneficial or detrimental” (Morse, 1991). The forty one women I interviewed were not all necessarily culturally or socially similar to myself and they were all in a different age group. However, because I have experienced pregnancy and birth I felt a rapport with these women that I think was mutual. Added to this, the interviews occurred on a territory decided by the woman and at a time to fit in with her busy life. During the interviews participants could query any part of the scan examination, result or plan of treatment. I reiterated that I was there primarily as a researcher. We made a note of the issue and I answered it at the end of the interview. To what extent I influenced women’s opinions I do not know, but I hope not at all. I am aware that Wilde (1992) cited influencing the respondent as an issue for health professionals conducting research, which includes midwives. Because the women might not gain as much as I could by participating in this research study, I did strive to give helpful answers. My extensive experience as both a home birth midwife and now a hospital midwife made it possible to easily answer questions of a clinical nature. But I was always mindful of the issue of professional etiquette and shared this fact with the women.
Completion of the interview phase

The forty interviews were completed by the 24 April 1995, but by coincidence on the same day another women phoned me to volunteer to go into the study, I accepted her offer because it seemed rude to decline. This is how the total reached forty one women. To prevent this situation from re-occurring, I visited the places where I had left information sheets and collected up all the forms still there. Despite this action early in June a colleague advised me that he had several candidates for my study and they would be contacting me in the next few weeks. I explained that the interviews were now completed and then quickly notified all the other people who had previously showed the information sheet to women on my behalf. In hindsight I could have had a letter ready to send out informing midwives and doctors when the period of recruitment was completed. This would have been more efficient. Interviews were conducted with women between fifteen and forty two weeks gestation. Thirty two (78%) women were interviewed after twenty one weeks.
Results, analysis and discussion

Quantitative Analysis

The responses to the closed questions were to be coded onto a simple data capture code sheet. Designing the coding sheet was left until I had completed all the interviews, because I suspected that I would not foretell all possibilities before I started. The coding sheet had also to comply for use in the University of Otago's SPSSX mainframe computer. The university's computing data entry service staff checked my proposed data form, and made their own specific checks to ensure my compliance with their specifications. Following completion of the interviews all the answers to the closed questions were coded onto the data capture sheets. I designed a master code interpreter to give meaning to what the numbers in the code boxes actually represented in the original survey form, and to be a permanent reference point.

Qualitative Analysis

The responses to all of the open questions were typed up using a word processor. By transcribing the answers myself I became more familiar with the issues and concerns of each woman and how this related to who she was and her current pregnancy. As I typed up each interview, the field notes made at the time, her other children and directions for finding the house, all helped me to remember each individual woman. For ease of sorting all information, the answers on the survey forms were first colour coded using highlighter pens. Words and sentences that related to the field notes, were highlighted in green. Issues about information were coded in yellow and concerns about fetal rights red. Answers that said the scan to be of benefit were coded pink, and the words describing negative experiences were blue. Not very original, but this helped me to sort out my data.
Verification

Four of the women in the study kindly agreed to assist me in the verification of their own survey forms. They did this in two ways, first by checking the coding interpreter and data capture code sheet, and then by reading their own transcripts after I had typed them. All four women said that the transcripts were an accurate assessment of the interview. They agreed with the five broad themes that I selected as being the dominant themes. I knew that the very questions that I chose to ask had already defined what the major themes in the women's responses would be. Nevertheless I felt it was important to make that check for verification with a representative sample of the women. This was also to fulfil my personal goal to be true to these women in saying how they experience ultrasound. At this stage I had also allocated a pseudonym to each woman in the study. To my surprise three out of the four women said they thought it was not necessary to know what name they were to be given. This was because I had not asked them to agree to this in the beginning and that by knowing their pseudonym it lessened the feeling of confidentiality that I had promised.

Reliability

As our subjective world is always changing I would not expect a future study to be identical to the current one. Furthermore given the idiosyncrasy of research perspectives, I would not expect another researcher to produce an identical interpretation of the responses I have reviewed. The women who participated in this study selected themselves, so it is conceivable that they are a select, non representative group. In making this point, it must also be borne in mind that for each pregnancy, the circumstances will be unique to that women at that particular time, although at the outset my intention was to have a truly representative group of pregnant women having an ultrasound examination.
In the results chapters that are based on the transcripts, I have included a large number of quotations from the women. These quotes are somewhat streamlined in that I have not repeated the question each time. And in some instances I omit repeated words because they are particular speech patterns which do not add to the meaning. I have treated the information given by the women as legitimate data. For instance in the first question which asks for the woman's perception of why her health professional sent her for a scan, her response serves as the appropriate indication to her. In this respect the results of the study meet the requirements of Goodwin and Goodwin (1984) for reliability and consistency.

Quantitative Description of the Study Population

A total of forty-one interviews were conducted with women from age eighteen to forty. Most of the women were European, thirty-eight (92.6%) and three (7.5%) were Maori. One sample Chi square tests were used to compare marital status, nuptuality and parity of the women in the study group with the distributions for the New Zealand population in 1993 (Demographic Trends 1994). Comparisons were made with data for the whole of New Zealand for age, marital status and parity. The median age of women having babies in New Zealand in 1993 was twenty-eight, compared with twenty nine in this sample, not a significant difference. I thought knowing the age of women was important. A first time mother, for example over thirty-five years, may have been busy developing her career or waiting for just the right circumstances before becoming pregnant. At the same time she would be aware of an increasing possibility of birth defects. These issues could presumably affect the way she would view the ultrasound examination. Because of this, my expectation was to hear older mothers discuss the examination with a deeper awareness of the issues. This possibility was indicated first by Mc Robbie (1982), then later by Sanelwoski and Jones (1996).
A one sample chi squared test showed a significant difference for marital status (nuptuality), (\(\chi^2 = 4.28, \text{df} = 1, p < 0.05\)). In New Zealand overall, 62% of women giving birth to a child were married compared with 46% in this sample. Fewer women in this sample were married when compared with national figures, although a number of the women were living in de-facto relationships. My impressions on visiting the women at home were that married and women in de-facto relationships seemed functionally the same. They appeared as equally loving and supportive in their arrangements, and therefore warrant no further explanation. The difference for parity was not significant, (\(\chi^2 = 1.96, \text{df} = 3, p > 0.05\)). The figures for New Zealand showed that 37.4% of women were having their first baby in 1993, 33.5% their second, 18.3 their third, 10.8% their fourth or more. The comparable figures for this sample were 30.2% 32.6% 20.9% 16.3%. These ranges were not significantly different to New Zealand as a whole showing similar family size despite the differing marriage arrangements (Appendix F).

In the study group twenty-three (56%) women had completed tertiary qualifications after leaving school, fifteen (36.5%) had gained school certificate and three (7.5%) women had left school at the age of fifteen years. These compared with the 1995 results for New Zealand as a whole, which showed the comparable figures for women were 30%, 30%, 33%. The Office of Statistics New Zealand records a fourth group of 6% for women with post school qualifications but no school qualifications. I did not record this level of detail and this subsequently limits the usefulness of my collecting the educational status of this study group. However the information I did collect shows that a significant number of women in this study recorded higher rates of tertiary education than the general population.

One explanation that I can offer for the higher than average educational achievement is that one of the main employment occupations in Dunedin is related to tertiary institutions. Certainly several of the women told me that they worked as teachers and lecturers. I was interested in the educational level of the women. Increased education can make women more confident. This increased confidence may
in turn enable a woman to feel herself more on equal terms with health professionals. Generally, a sense of equality encourages one to ask more questions. I also thought the more educated women may have had a greater understanding of the part the examination played in their pregnancy care.

**History of any significant health complications**

Women were asked to list any significant health conditions or concerns that they had before any pregnancies. Over half the women, twenty-seven, reported no health conditions or concerns (65.8%). Twelve of the women had one health complication (29.2%). One woman had two health complications, this was Carla who had both chronic renal disease and infertility (2.4%). Carla had already many encounters with health professionals and this seemed to have left her "hospital-wise". Asthma was a common health complaint for five of the women (12.1%). And a further five of the women in this study reported being treated for infertility (12.1%). None of the women in this study talked about having any physical or psychological disability.

**Relevant obstetric complications**

I asked women to list any complications in their obstetric history arising from previous pregnancies, labours or births. Twenty-three women had no history of obstetric complications (56%). Twelve women had one previous obstetric complication (29.2%). Five of the women had two obstetric complications (12.1%). Thea, who had started both her previous pregnancies in good health had developed more pregnancy related complications during this pregnancy than the other women in the sample. She had developed Pre-eclampsia of Pregnancy (P.I.H) in her first pregnancy which had been treated by an induction of labour and in her second pregnancy a placenta previa and an Ante Partum Haemorrhage (APH) necessitating a Caesarean Section Operation (C.S).
Table 1. History of relevant obstetric complications.

<table>
<thead>
<tr>
<th>Obstetric History</th>
<th>Number of Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two Miscarriages and a D&amp;C</td>
<td>5 12.1%</td>
</tr>
<tr>
<td>Caesarean Operation</td>
<td>5 12.1%</td>
</tr>
<tr>
<td>Termination of Pregnancy</td>
<td>4 9.7%</td>
</tr>
<tr>
<td>Pre-eclampsia of Pregnancy</td>
<td>3 7.5%</td>
</tr>
<tr>
<td>APH or PPH</td>
<td>3 7.5%</td>
</tr>
<tr>
<td>Premature Labour</td>
<td>1 2.4%</td>
</tr>
<tr>
<td>Intra Uterine Death</td>
<td>1 2.4%</td>
</tr>
<tr>
<td>Twins</td>
<td>1 2.4%</td>
</tr>
<tr>
<td>Hydatitiform Mole</td>
<td>1 2.4%</td>
</tr>
</tbody>
</table>

Table one shows what type of obstetric complications women recorded as well as the number of women who suffered from them.

Finding out about significant health disorders and any obstetric complications was important. At the time of the interview it helped me to understand issues the women were raising. It also put issues that were raised surrounding the examination in context. According to Bergum (1989) and Rothman (1988) women who have made prolonged efforts to conceive tend to have heightened emotional investment in the pregnancy process. This results in a sense that the baby must be monitored continuously. For some of these women they then swing emotionally between hope and distrust of the ability of their bodies to produce a live healthy 'special' baby.
Complications of the present pregnancy

Likewise it was important for me to know what complications if any were present with this current pregnancy. Repeated illness will entail additional personal stress and often some increased financial pressures. Women were asked if they had any complications or concerns with this pregnancy that were significant to the way the pregnancy would be managed by the health professionals. Twenty-eight of women, the majority, had no significant complications (68.2%). Six women reported one complication (14.6%), and three of the women reported two conditions (7.5%). Dale one of the women with a twin pregnancy had been very healthy at the start of this pregnancy but developed polyhydramnios, subsequently advised me by telephone when she suffered from premature rupture of her membranes at twenty six weeks. This was just after her interview with me and the information about this complication was not entered on her survey form. Otherwise any complications reported by the women are included in this table.

Table 2. Complications of the Present Pregnancy

<table>
<thead>
<tr>
<th>Complications of the Present Pregnancy</th>
<th>Number of Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>1 2.4%</td>
</tr>
<tr>
<td>Per vaginal Bleeding</td>
<td>4 9.7%</td>
</tr>
<tr>
<td>Placenta Preavioa</td>
<td>2 4.6%</td>
</tr>
<tr>
<td>Gestational Diabetes</td>
<td>2 4.6%</td>
</tr>
<tr>
<td>Twins</td>
<td>2 4.6%</td>
</tr>
<tr>
<td>Polyhydramnios</td>
<td>1 2.4%</td>
</tr>
<tr>
<td>Premature Labour</td>
<td>1 2.4%</td>
</tr>
<tr>
<td>Cone Biopsy</td>
<td>4 9.7%</td>
</tr>
</tbody>
</table>

Table two shows what conditions women had during the current pregnancy by number of women.
Background information

Data Analysis was dependent upon what questions I asked and how I asked them. This process began in the very early planning phase of the study, by taking the advice of an experienced medical statistician. The statistician explained the methods of analysis which I could use to meet my aims. She also highlighted the limitations that were inherent in my study, due to the small sample size. Data collected from the women is now presented in both quantitative and qualitative fashion. Quantitative data are presented, then supported and illustrated by qualitative quotations. I then discuss these results in relation to the relevant literature. Words and phrases appearing in the work in quotation marks without citations, or indented without quotation marks belong to the women. A short profile of the study participants is Appendix (G).

The results section is further divided into the same six topics covered in the literature review. This could be seen as a way of my editing or limiting the material but it was done for ease of sorting and analysing the many and complex responses. If, as I do, assert that the women's words are to be used as evidence then it needs to be clear that the evidence can be trusted. Therefore I have included all the responses from all the women, so that relationships suggested between different questions can be found in the same way the women saw them. This inclusion is supported as appropriate evidence for triangulated research by Goodwin and Goodwin (1984).

Two women in this study, Beth and Emma talk about the termination of pregnancies they had. These occurred following the diagnosis on ultrasound of fetal anomaly. For Beth this happened with the current pregnancy, and my interview took place within the week after the termination. Emma's situation was rather different as during the interview she requested that we focus on her previous pregnancy which had resulted in a termination. She was now pregnant again and at thirty weeks felt she had "safely" passed the critical time and this pregnancy was secure. Apart from Emma, all women are describing the last examination and discussing their feelings in relation
to the questions on the survey form.

Who is caring for you during this pregnancy?

- Your family GP?
- Another GP?
- Midwife?
- Hospital Obstetrician?
- Private Obstetrician?
- Who requested the scan examination?

Table 3. Lead maternity health professional per woman, against who requested the first ultrasound examination of this pregnancy.

<table>
<thead>
<tr>
<th>Lead Maternity Provider</th>
<th>Number of Women</th>
<th>% of Women</th>
<th>Number Requested the Scan</th>
<th>% Requested the Scan</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Practitioner</td>
<td>13</td>
<td>31.7%</td>
<td>13</td>
<td>31.7%</td>
</tr>
<tr>
<td>Midwife</td>
<td>13</td>
<td>31.7%</td>
<td>2</td>
<td>4.6% *</td>
</tr>
<tr>
<td>Hospital Obstetrician</td>
<td>1</td>
<td>2.4%</td>
<td>2</td>
<td>4.6%</td>
</tr>
<tr>
<td>Private Specialist</td>
<td>14</td>
<td>34.1%</td>
<td>11</td>
<td>26.8%</td>
</tr>
<tr>
<td>Family Planning clinic</td>
<td>1</td>
<td>2.4%</td>
<td>1</td>
<td>2.4%</td>
</tr>
<tr>
<td>Sub Total</td>
<td></td>
<td></td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Maternal Choice</td>
<td></td>
<td></td>
<td>12</td>
<td>29.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>41</strong></td>
<td></td>
<td><strong>41</strong></td>
<td></td>
</tr>
</tbody>
</table>

The New Zealand College of Midwives (1995) does not recommend the routine use of ultrasound scanning.

Table three shows three things. It shows which health professional women said was responsible for their antenatal care. The middle column shows how many women were cared for by each of the health professionals. The third column shows
which health professionals requested the first ultrasound during this pregnancy. The twelve remaining women in this study, (29.2%), attended for the examination at their own request, (maternal choice). This table shows that most of the women receiving midwifery only care initiated the examination for themselves. One woman commented that she asked the midwife to fill out an ultrasound examination request form and write the indication for examination to be 'routine 18 week check please'. This supports the observation of Youngblood (1989), that there is a strong element of maternal demand for ultrasound examination during pregnancy.
Indication for the ultrasound examination

There was no link between educational status and whom the women chose to provide their pregnancy care. A number of women said they had two health professionals providing maternity care. Women reported no known disagreements between health professionals about the need for the examination. There was also no marked difference in educational status for the women who initiated the examination themselves.

*If you had not wanted this scan do you think you could have declined?*

Thirty-seven of the women said yes (90.2%), and three women said no (7.5%). The majority of women thought this was an extra-ordinary question as the scan was a pleasant positive experience and also, they thought, necessary, so why would one decline. One woman felt she had good reason to be sceptical about the benefits of the examination. In her previous pregnancy a scan examination had resulted in her having her dates re-reassigned by three weeks which led to an induction of labour and a baby that was jaundiced, difficult to rouse, needed extra care and did not breast feed. She held bitter memories of the painful prolonged induction and failed attempts to breast feed. Issues surrounding how women feel and what actually happens in practical terms to women when mistakes are made when reassigning dates for the last menstrual period have been ignored in published reports by Bange and Gendall (1987), Youngblood (1989) and Reed (1996). This is one of the problems that Beech (1992) and Oakley (1984) described when they said that the medical examinations are often believed over the woman.

Wendy: She was pushing all the time, the 18 week routine one was fine, but now I am a breech. She made the way the baby was lying the reason, she really bullied me. I could feel it stuck in my ribs and it kicks down there. At 38 weeks I know I can have the baby. Only scanned because its not head first. Only reason to please her. Not that keen to be scanned a lot as they messed about with my dates last time and I was induced too early.
Wendy was pleased to be pregnant but also worried about her labour now that baby was presenting by the breech, (bottom first). She felt that the scans in her last pregnancy had contributed to her having a long labour and then a small baby. She asked many questions about breech labours and whether there were increased risks to the baby. It occurred to me that the General Practitioner (GP) might have felt that Wendy's attitude showed that she did not care about the pregnancy. The reality was, I believe from what Wendy said, that she was frightened about a breech labour and not able to express this to her GP. On the other hand Wendy could not know if her GP herself was anxious about why this baby was presenting by the breech, and was seeking reassurance from the examination. This situation reveals the importance of the point made by Warren (1989) about “process” to the informed consent procedure, recall also Bastion’s (1988) observations of pregnant women and informed consent.

Local protocol similar to the one suggested by Duff (1992), for a breech presentation after 37 weeks recommends an ultrasound examination to assess fetal weight and rule out fetal abnormality. However a recent study by Nwosu et al. (1993), found in a study of 79 undiagnosed breech presentations that the outcomes for ‘breeches' were better when they had not been diagnosed, resulting in fewer caesarean sections.

Women had no difficulty in remembering the indication or reason for the very first ultrasound and any other examinations they had during the present pregnancy. This fact was important to the study because I was meeting women at different gestational stages throughout the pregnancy. Many women had already had more than one examination. Twelve (29.2%) of the women were able to provide a second reason or indication for the scan. I used the same list on my survey form as the one suggested by Duff, (1992) except that I omitted the question on fetal abnormality. This was done at the suggestion of several local obstetric consultants who advised me that to their knowledge current practice in Otago was to perform an Amniocentesis or Chorionic Villus Sample for suspected fetal abnormality early in the pregnancy.
Why was this scan being done?

To check when baby is due?

To check baby's growth?

Problems such as pain or bleeding?

Possibility of more than one baby?

It's done routinely?

Other?

Table 4.

Primary and secondary clinical indication for the ultrasound examination.

<table>
<thead>
<tr>
<th>Clinical Indication</th>
<th>Number of Women</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st Indication</td>
</tr>
<tr>
<td>Routine</td>
<td>21 51.2%</td>
</tr>
<tr>
<td>Dating</td>
<td>12 29.2%</td>
</tr>
<tr>
<td>Growth</td>
<td>2  4.6%</td>
</tr>
<tr>
<td>Maternal Choice</td>
<td>3  7.5%</td>
</tr>
<tr>
<td>Pelvic Pain</td>
<td>2  4.6%</td>
</tr>
<tr>
<td>Placental Grading</td>
<td>2  4.6%</td>
</tr>
<tr>
<td>Twins</td>
<td>41</td>
</tr>
</tbody>
</table>

Table four shows that just over half the women in this study could give no clinical indication for the examination and ticked 'routine' only. Thus despite the majority of current medical research by WHO (1991), Newnham et al. (1993), Ewigman et al. (1993), Beech & Robinson (1994), Enkin et al. (1991), Wagner (1994), Le Fevre et al. (1993), not recommending routine scans, this was the only reason they were performed. It has been reported by Wagner (1994) that mistakes are more likely with universal ultrasound scanning, since accuracy is likely to be less than that reported by experts. In addition it has been suggested that a maternal choice or routine examination may not alert the operator to be looking for something. Hollingsworth (1994), Ewigman et al. (1990). Reed (1996) reported a high number of women in her
practice with uncertain dates. Women in this present study were very sure that they saw a scan examination as a routine procedure, and that they considered it represented appropriate ante-natal care. Because of these attitudes it would be hard to refuse a woman's request for a scan, despite the high rates of false positives and false negatives.

Anne Just said scan at 16-20 wks and I thought it was the "right" thing to do, you know, routine

Ula I think generally this is it, my GP had his own, (scanner) the picture goes in your notes

Nora You are supposed to have one or two, so I guess they are routine.

Brook They are now considered part of good routine pregnancy care.

Three of the women gave the only reason for scan as their "personal choice". For Gina who chose to have the one scan at 32 weeks said

It was my decision, I am having a home birth and you have to double prove that you are responsible. The scan was definitely my own personal choice.

On the surface this response by Gina supports the observation by Youngblood, (1989) that there is an element of maternal demand. However demand seems to be a rather dismissive term to use, as I interpreted Gina's explanation as a more thoughtful and reasonable request under the circumstances. It is not difficult to understand why Gina needed to justify the decision for the scan. Women who chose to have a home birth report that they suffer from some pressure to demonstrate that a home birth is an intelligent and responsible decision, but generally speaking they also try to avoid attending for a scan. This is because if something is found it will be the cue for further diagnostic investigations and they then become locked into a hospital based medical model of care. This kind of responsible but reluctant decision making has been described by Gregg (1993) and Beech (1992), who have observed that there is increasingly a medical and social expectation about what is appropriate behaviour for pregnant women. Gregg also notes that every new technological development leads to new opportunities to control pregnant women. This is an important factor for women wanting to birth away from a main centre.
Iona  I wanted to go for personal reasons. At 10 weeks I thought it would be easier to deal with something being wrong. This is based on my mother’s experience of a later termination of pregnancy for an abnormality. It was pretty shocking. I then made the 18 week appointment with the operator for baby's weight and size.

Iona was acting in a way to ‘ward off’ what her mother had experienced.

Assessment of Gestational age (dating scans)

For the group being scanned for correct dating of the pregnancy, twelve (29.2%) of the women did not know their due date for delivery of the baby. The reason several women gave for a dating scan was because a pregnancy test had left them confused, or they had a contraceptive failure and could not determine a possible conception date. Dating scans happened very indiscriminately throughout the pregnancies, from as early as week one right through to eighteen weeks. Women need to know when they can expect to deliver their babies as do the health professionals caring for them, and a dating scan in these circumstances was highly valued. Nearly one quarter of this sample had a scan for dating, similar to the percentage mentioned by Bange and Gendall, (1987) and Duff (1992). None of the women in this sample had their own dates changed by the scan. Two women were having their own dates confirmed, in order that a chorionic villus sample (CVS) or amniocentesis test could be performed later in the pregnancy.

Kara  I had three negative pregnancy tests when I was not having any periods. It was a very confusing situation. I felt pregnant. My GP suggested a scan and I supported the idea. It was a good idea. I knew where I stood.

Alice I had a depo failure with two small bleeds and we did not know if they were bleeds or periods.
Jade  On clinical examination my GP was unable to confirm I was pregnant and I was sore so she sent me for a scan to confirm a pregnancy and sort out a date. I was just 8 weeks.

Fay  I was on the pill, so to know when the baby is due?

Assessment of gestational age by scan, a dating scan, is based on the fact that in early pregnancy, fetal growth is rapid, there is little biological variation in size and pathological growth retardation is uncommon. Since it is not possible to identify all the women in whom accurate knowledge of gestational age may become essential later in the pregnancy, these "dating" scans were important, recall Youngblood (1989) on dating scans. According to the work by Kremkau (1984) and Jurkovic et al. (1995) scans in the first trimester, up to thirteen weeks will provide an expected date of delivery usually accurate to within five days. In embryology the gestational age is measured from the day of conception whereas women measure it from the first day of the last menstrual period. Scans after thirteen weeks and up to eighteen weeks usually predict the date of delivery to within two weeks. In this study sample nine women had a dating scan in the first trimester before thirteen weeks, the remaining three scans were performed in the second trimester. Reed (1996) is worried that unless the time of ovulation is known, then all pregnancies are at risk because of uncertain dates.

Pelvic pain, bleeding and placental grading

Full examination of the placenta has been described in studies by Kremkau, (1984) Proud, (1989) and Jurkovic et al. (1995). In addition to grading the placental function as it matures during the gestational period there has been the ability to diagnose the location of the placenta and if the placenta is separating from the uterine wall as in the case of abruptio placenta. A woman with recurrent painless vaginal bleeding in late pregnancy needs to know where the placenta is, as does the midwife and doctor taking care of her. Although at times the placenta is more difficult to visualise if it is situated posteriorly because of the acoustic shadowing of the fetus, generally the examination can show the position of the placenta accurately.
Ultrasound examination is also clinically indicated for pain and may often represent a complication arising from an ovarian cysts, ultrasound for these circumstances is supported by Duff (1992, p.237).

Erin I have an ovarian cyst which may or may not be important. We needed to determine if this was going to be an ectopic pregnancy or even another cyst. I needed a scan to make a differential diagnosis and clarify the nature of the left sided pelvic pain. And then I could plan my pregnancy care. The examination was important but I have mixed feelings about this because the cyst may not really be important anyway.

Clare I am 42 weeks pregnant with no sign of labour commencing. My midwife felt overall that I needed it to examine the placenta for signs of postmaturity

**Scans indicated because of concerns of fetal growth**

Scans to measure fetal growth were performed anywhere between eight and thirty-eight weeks. For some women they were booked throughout the pregnancy in a serial fashion. For others, as a one-off, in response to a maternal condition or simply to check fetal growth against a previous scan. Duff, (1992) recommended serial measurements of the fetal size in high risk pregnancies with at least two weekly intervals to allow close observation of continuing growth. This policy was being adhered to in Ada's pregnancy in an effort to avoid the previous tragedies of a stillbirth and a growth retarded baby. By combining a variety of assessments it was planned to observe the pregnancy until a time when baby was sufficiently mature to be safely delivered. But the study by Newnham et al. (1993) suggests that five or more scans and doppler flow may increase the proportion of growth retarded babies, the very condition that it was intended to diagnose. Statistically, of course growth retarded babies or those suspected of this will have a higher examination rate. Also more examinations will pick up more growth retarded babies. I did not ask women what
type of examination they had, I trust that they were not given repeated doppler examinations.

Beech and Robinson (1994) and Odent (1995) claimed that serial examinations also overlook the fact that babies grow at different rates and spurts. Midwives observe that a baby suspected of growing too slowly one week might naturally have caught up by the next. They also say that when this technology is used, insufficient attention is given to the way mother's diet and lifestyle may affect fetal growth. Thus the use of scans to monitor progress is fraught with uncertainty.

Ada I have fortnightly scans due to a previous growth retarded baby in my first pregnancy and to check the growth of baby the fluid around the baby and doppler. At 28 weeks I had a stillbirth in my second pregnancy for no reason. The fortnightly scans measures the baby's growth, and I have a monitor (ctg) every second day.

Ada felt her poor history justified this close monitoring. She placed a great deal of faith in it and the results of each test. There was a round trip of three hours for every test she attended in Dunedin except when she made arrangements to stay with a relative. Even then, that meant arranging care for her other pre-schooler. Ada's first scan was at eight weeks and by thirty five weeks she had ten. The ctg she refers to is a method of continuous electronic fetal heart rate monitoring, using doppler ultrasound, and generally performed for periods of about twenty minutes several times a week, for babies that are considered to be at risk. The doppler Ada mentioned was performed in the radiology department and examined the blood flow and waveform in the fetal umbilical artery. Doppler studies are thought to provide information on the pathophysiology for fetal growth retarded babies. Ada's situation demonstrates the practical commitment women make to follow medical advice and do all that they can to help have a healthy baby even though these tests cannot give them any real security. Ada was constantly seeking reassurance that this baby was growing normally, by attending for the ultrasound examination.
Some reasons that Reed (1996) gives for routine ultrasound is for the provision of information to women and for the improved relationship with the health care system. One could argue that because repeated prolonged doppler is not recommended, Ada was exposed to health care that was more malicifient than beneficent. Recall the Chervenak and Mc Cullough (1994) editorial on failing to provide patients with full information.

Table 5  The total number of scans that each women had against the first indication for the scan

<table>
<thead>
<tr>
<th>Indication for 1st scan</th>
<th>Number of women</th>
<th>% of women</th>
<th>Mean number of scans</th>
<th>Total for group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routine</td>
<td>21</td>
<td>51.2%</td>
<td>3.0</td>
<td>65</td>
</tr>
<tr>
<td>Dating</td>
<td>12</td>
<td>29.2%</td>
<td>3.7</td>
<td>45</td>
</tr>
<tr>
<td>Growth</td>
<td>2</td>
<td>4.6%</td>
<td>10.5</td>
<td>21</td>
</tr>
<tr>
<td>Maternal Choice</td>
<td>3</td>
<td>7.5%</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Placental Grading</td>
<td>1</td>
<td>2.4%</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Pain</td>
<td>2</td>
<td>4.6%</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>41</strong></td>
<td></td>
<td><strong>144</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table five shows the mean number of ultrasound examinations for the group of women was (3.5). Twenty women had their first examination before twelve-weeks with a mean of four. In total this group of women had eighty-two examinations. Sixteen women had their first examination after twelve weeks with a mean of three, in total this group had fifty three examinations.

The five women having their first examination after twenty weeks had a mean of 1.9, and a total of nine examinations. I found that the earlier the woman had the examination the more she had in total. The mean number of scans recorded by
Buckingham et al. (1991) in Dunedin was 1.5. I thought the increase in the number of examinations since that study was significant in light of studies by Wagner (1994) Enkin et al. (1991) Le Fevre et al. (1993) showing little clinical benefit.

Could you choose where to have your scan?

Six women answered yes (14.6%), all of these women were attending a private specialist. These women reported that they were advised what was available and given the choice between the examination with the ante-natal visit, the private clinic or the public hospital. They all chose, which seemed quite natural to me, to have the scan examination performed by the Obstetrician at the same time as attending for their ante-natal visit. The remainder of the group thirty-five (85.3%) women answered that they could not choose. The rural women were knowledgeable about what facilities were available, both locally and in Dunedin. But they accepted the fact that they were sent to different locations at different times during the pregnancy at the discretion of the health professional.

Gina who lived in Oamaru    That never occurred to me, I don't think that was offered as a choice

Ella who also lived in Oamaru    Very pleased to have the scan in Oamaru for the very early ones but was sent to Dunedin later

The remaining women in the study had limited knowledge of what facilities were available to them and were all directed by their health professional. Two of the women who had previously undergone treatment for infertility at the public hospital, continued to have ultrasound examinations there throughout the pregnancies. Two women who were admitted to the public hospital, had all subsequent scans in that facility, either in the radiology department or in the maternity centre. Previously their examinations had been at the private radiology clinic. The remainder of the sample had scan examinations performed at the private radiology clinic in Dunedin.
Kara  The referral form was made out by my GP.

Mary  Not given an option so don't know. I guess that's no.

Ula  No, only one place in Dunedin that I know of,

Jean  Well, when I lost my first baby I went in for the midwife to do a trace (CTG) at the hospital. The baby had not moved and the midwife could not find a heartbeat. Then this was confirmed so the GP sent us up to the radiology clinic. It was quite late by then when we had been seen so we went home for the night and arranged with the GP to come back down the next day to the hospital to start me off. I didn't know I could have stayed put, and had it there and then. [the scan] That might have been better.

Very few Dunedin women knew that ultrasound examinations were available in their public hospital located in the radiology department and in the Queen Mary Maternity Centre. This fact was demonstrated by Jean's experience and shows how little real choice women have. The principle of respect for autonomy must include the perspective of the patient's interests. We must assume that Jean was competent to decide where to have the examination. But she was not allowed to exercise this choice, even though it may have made quite a difference to her under the circumstances.

*Who accompanied you for the scan?*

Thirty women took an adult with them (73.1%), and eleven women took children with them (26.8%). All women recommended taking an adult. This was simply for the pleasure of sharing the experience.

Polly  For my husband it's a plus. He would not miss the scan it is important as a work appointment. A very significant experience.
In some cases this was to provide adult support when the examination showed a fetal abnormality. Beth had a fetal abnormality diagnosed by ultrasound examination and subsequently a termination of the pregnancy. The sadness of this tragedy begins to come through as Beth describes why women should have an adult person with them.

Beth, you must have another adult with you just in case, tell women, I had both the children with me I can't remember how I got home, I felt so wretched. Remember this was after four months of not being able to conceive and the six week scan was all right I had my video all ready to take to Invercargill with us. Remember this was last thing on Friday night before a weekend away at Invercargill for a holiday. You must have an adult to look after the children,

Kara, women should have an adult with them at the scan if possible. Taking children is OK. But should have support to help look after them during the scan, I am concerned about what happens when something is identified as being wrong and the support needed to help deal with it. I am also concerned about how trained the operators are to support the woman and who looks after them when something is found.

Ada, with my last pregnancy my GP came to verify the results and to verify the death and he was very sensitive, very good. But it was 45 minutes before my husband came from work I am very apprehensive and need a support person with me. This is due to the fact that I had lost my second baby at 28 weeks and a scan was used to verify its death. The first four scans of this pregnancy I experienced a lot of anxiety.

Fay, my mother went along with me last time and they would not let her in, I wanted mum to see the grandchild. I can be quite "bossy" so I took Megan my sister in law with me this time and made it obvious she was staying. Then I explained everything to her myself.
Your Pregnancy (1994, p.35) advises women to ask to have someone with them at the time of scan so it is difficult to understand why Fay encountered this resistance to her mother accompanying her from the staff. Proud, (1985) a researcher and midwife in England found that there was no universal policy for single women to be allowed to take a mother or other family member with them for support. Radiology departments there reported that there was a feeling from the staff that this was an improper use of medicine which they saw as a medical examination but that the relatives saw it as a social event.

Summary

My interest in the "routine" indication was to try to understand how these routine examinations could be justified given the continuing world wide evidence to the contrary. For instance a recent paper by Chamberlain and Boyd (1996) comment that there is still a need for more studies to say that antenatal ultrasound represents good evidence based practice. I was equally interested to know how significant the examination was to changing subsequent antenatal care. Women having the examination either on "maternal demand" or "routine" showed that these women were not passive but welcomed the routine examination as a benefit and pleasure. Thus the decision to have an ultrasound examination occurs in a social context in which the support is more or less overt. What I did find was that one routine examination often led to the need for more examinations to clarify suspicious findings.

Women’s subjective feelings of health and well being during pregnancy was to some extent eroded from ‘suspicious scans’. This was replaced with a feeling of apprehension and insecurity until the next scan. In my study this occurred for seven of the women, note the similarities with studies by Enkin et al. (1991) Le Fevre et al. (1993) and Beech and Robinson (1994). Most of the women in this study agreed to as many examinations as requested or suggested because they preferred to have the predictability that they felt the examination would achieve. However a study by Brand shows that the specificity of ultrasound can be poor and may not assist with decision making (Brand et al. 1994).
Associated costs, reasonable costs and resource implications.

Are there any costs associated with attending, for you or anyone else, such as:
Child care?
Time off work?
Travel time?
Petrol?
Other?

Most women in this study did not find costs associated with attending for a scan a significant deterrent to having a scan. However, I have not sampled women who did not attend for a scan who may have been put off by associated costs. Thirteen women listed time off work (31.7%). Four women listed travel time (9.7%). Seventeen listed petrol as a cost (41.4%). Dunedin is a very small city to drive across, so I was not surprised that only rural women considered petrol as a cost.

I did not ask women if they had to pay for the examination as I knew there was no charge in Otago. Two women had been charged for the scans that they had before moving to Otago, $65 for a routine 18 week scan in Auckland, and $15 for a routine scan in Christchurch. Women attending the private obstetrician knew a cost was included as part of their ante natal care but not as an isolated expense. Furthermore, all of these women had private health insurance and so did not classify a scan as a cost to themselves.

Laura  Yes, coming to town to the hospital is two days off work for my husband to drive me, they never think of that do they. Travelling in the car with a little girl to get here my husband is not paid when he is off. Then my appointment was to be followed by the Doctor at 3.30. I am so disappointed a five minute scan is a waste of all our time really just to fit with the protocols. If my sister wasn't here we would have the worry of a motel and we don't have money for this. We now have to stay an extra
night all this worry and sitting in a car for three hours with a girl who does not want to be there hardly healthy. My Doctor did not turn up so now I have another nights worry and expense.

Laura had scans at the rural hospital at 21 and 37 weeks. Both of these scans showed her baby to be growing and developing normally. At 38 weeks a blood test for Glucose Tolerance (GGT) was elevated, so to comply with the obstetric regulations for a rural birth, Laura had been obliged to attend for a consultation in Dunedin which had included a scan at the public hospital. That scan had shown an increased fetal abdominal circumference (ac), and therefore a follow up scan was made for the following week at 39 weeks. This 39 week scan was the subject of the survey and this time showed normal (ac) measurement but now the baby's arms and legs were measured longer than the week previously. Laura reported that the two scans at the public hospital had been quite perfunctory with little attention by the operator as to why she was there or any information being used from previous scans. This made her feel that as a family they were wasting their time and money and not helping her at all. She would not have chosen to drive to Dunedin at this stage in her pregnancy. Laura reported that she had an anxious two weeks attending for the scan, then worrying about the baby's growth and where she would be allowed to deliver, close to home as she wished, or in Dunedin.

This experience bears little relationship to the benefits of ultrasound described by Romero (1993) De Vore (1994) Chevenak and Mc Cullough (1994) Reed (1996) and Youngblood (1989). No doubt when these clinicians describe the benefits to women of ultrasound they refer to the provision of a service based on their own standards, [better than that experienced by Laura]. PICS as described by Chervenak and Mc Cullough (1994, p. 178) empowers women to 'opt out' which I believe is a powerful anti paternalistic check, but this was not the case for Laura.
In this study five women had to travel from the country to Dunedin for the ultrasound examination. Three of these women found this an added expense. They thought the round trip cost about $200 which included petrol, time off work as well as a lunch meal. Laura reported more difficulty and inconvenience than any of the other women in this study.

Preferences about the means by which scans are funded.

Would it be reasonable for the health authorities, to request that women pay for scans?

If no, why?

If yes, what would be a reasonable charge?

Thirty women felt that there should be no charges at all (73.1%). All of the women who did not want charges brought in for scans did so for reasons of social equity as the main concern. Similarly, Romero (1993 is concerned that the results of the RADIUS study could dictate health care policy, that this could mean women without economic resources may be denied ultrasound.

Leah

Women may not have a scan when perhaps they should because of a possible problem foreseen by their carer due to financial problems, and if women had to pay for scans then it may start a trend and all visits to the doctor would have to be paid for.

Jill

It should be part of what you are entitled too, for the poor as well, so treatments can be planned. The costs would eventually be greater to the state if more sick babies were born because abnormalities would not be picked up.

Carol

It would take away people's choices; a great many couples could not afford the money, and I myself do enjoy the experience. Why should others be denied it?
Zena: May restrict access for families under financial pressure, also pregnancy is expensive enough. If people have to pay they might not have one which could lead to problems later in the pregnancy.

Erin: Disadvantaged women would be further disadvantaged. It would limit their choices, it would cause a lot of women to go without. I imagine they are quite expensive it would be to the detriment of poorer women.

Polly: If we had no scans freely available this would lead to one particular group of families bearing the burdens of handicapped babies.

Kara: Costs of scans should continue to be part of the public health funding, not as a direct cost to the individual women. If it was a cost a large proportion of the population would not have access to scans. The scan should continue to be a choice for women and be free from any "rider" about the consequences. This is because scans are an important part of knowledge about your pregnancy/baby.

Women who thought the information gained from ultrasound examination was important felt that they had an obligation to speak out, about the possibility of charging, note that this has been found in other studies (Rothman, 1988); (Berwick and Weinstein, 1985). Women felt the examination which offered advantages to some might, because of a fee, actually worsen the lot of others, who were already disadvantaged due to low incomes. If a fee was necessary then women felt only a nominal amount could be considered as reasonable. Ten to twenty dollars was the most often quoted amount. This figure was similar to the outpatient part-charging which was introduced for a short while at the local Crown Health Enterprise (CHE) and women were probably linking this up in their thinking. The one exception to this lesser amount came from a woman attending a private specialist who thought that a fee of eighty to one hundred dollars would be appropriate.
Gail   The scan video has been sent to Denmark for the grandparents so they have a 20 minute movie of our 18 week baby. It was more active than ever before. They love it.

Five women could see some justification for charging but only for a photograph or video (12.1%). The FDA (1994) had expressed concern of the misuse of diagnostic ultrasound equipment being used to make "keepsake" videos for families as machines were left on as long as an hour to get a good picture (Appendix A). I noted that the video for many women had replaced the scan photograph as an important keepsake of the fetal life of the baby. Twenty-six women were given one or more photographs (63.4%), and nine of the women took a video along to record their baby's development (21.9%). Several women had all their scan examinations recorded in a serial fashion on video and expected to add on the labour and birth, thus making a complete story of the baby's growth and development, which could be shared with friends and relatives. The fetal photograph and video had become a prized memento of family life, but occasionally the operator forgot to insert the video.

Leah   I took a blank video but it was not put in the machine. The scan with my last pregnancy seemed a much more positive experience. The operator she seemed to genuinely care as well

On the other hand, having the video available did not equate with getting film footage or a live baby. Something I had not thought about when designing my questionnaire. This is exactly what Mooney and Lange (1993) were drawing attention to in their paper, that an associated cost of harming women and families in this way is not measured when assessing only monetary costs of these examinations.

Beth   I was trying to video the scan but it did not turn out. Came home with a blank video I think she wiped it or what I don't know, I just knew something was wrong. I didn't know if low fluid mattered (On a repeat scan three days later a diagnosis of no fetal kidney was confirmed ).
Emma: The video of baby at 11 and 17 weeks is fine. We did a video at 12 at the threatened miscarriage and this one picked up the cystic hygroma and is the most vivid scan in my memory not because we saw anything, I didn't, but the impact was the most long lasting. We all looked at the video together family decision to terminate the baby after watching the video.

Four women thought a part charge for the keepsake video would be fair, (9.7%) but complex to administer.

Jade: Depends, clinical need = free, i.e. safety, genetic, ectopic but for something like curiosity of babies sex = no, however there are some women who would benefit from knowing the sex of the baby because of a gender related genetic disease and then not be able to pay.

Honour: Well yes and no. No if related to health problems or factors to have peace of mind about the health of your fetus or mental preparation if baby has to have surgery but then this could be more stressful. A paradox really, if there is no medical reason, curiosity or a trivial one then should pay.

Emma: Yes we should be paying our way, and no because not everyone could pay babies are born because the abnormalities would not be picked up. Perhaps photos and videos could be a charge.

Women in this study who were told that there was something wrong or possibly wrong with baby had no immediate or timely post-examination counselling available, even though this would have made the experience more bearable for them. Wagner (1994) said that making counselling available at the centre where ultrasound is performed should occur but will have considerable resource implications.

A sonographer colleague explained her manner of working,

In our department on finding an anomaly, I will tell the woman that I think that there is something wrong and call the ultrasound consultant.
to verify my findings right there and then. He/She will talk to the patient and tell as much as possible about the anomaly or fetal death. Meanwhile, we have (hopefully) contacted the midwife or consultant or GP and have arranged for the woman to see an obstetric consultant or senior registrar to answer further questions, and there are many. All this time she and her partner and children stay within the ultrasound room (we wish we had a special nice room) and then they are escorted by one of our staff to the delivery suite to be sure they make it safely. The midwifery staff take over from that point. Meanwhile, the other patients are waiting and we are way behind time, but that's the way it has to be.

The process followed by this sonographer appears to be very sensitive to the circumstances of individual women. Unfortunately, and for whatever reason there were a few women in this study who were not treated so respectfully or sensitively.

Figure 1. *How long did the scan examination take?*

![Graph showing the length of examination](image)

Figure 1 shows that just over half of the women said the examination lasted between fifteen to thirty minutes.
Two things struck me about the women's responses. One, was that the women who chose to have a scan did not feel any differently than the women who were attending for a scan because of a medical reason. Two, that most of the women now expressed themselves as though having this examination was a "right". This right came about because they believed that the examination could prevent all sorts of misery. This was so for all age groups and educational groups. There is no literature regarding the situation in which Beth and Emma found themselves. I was curious about the effect on women and children of watching baby the on the screen when they later decided to have an abortion. It also occurred to me that there might be legal ramifications for the operators if, on post mortem the baby was found to have been healthy. Chamberlain and Boyd, (1996) emphasis that although examination of the fetus after termination is extremely important for everyone involved, it cannot always provide information about normality and function.

Given the natural history and subtlety of certain serious congenital abnormalities, ultrasound scanning should not be expected to detect all anomalies prenatally. Some conditions - for example, microcephaly and the Dandy - Walker malformation or variant - may develop late in pregnancy and may not be diagnosed from a scan at 18-20 weeks. Chamberlain and Boyd (1996, pp.1254-1255).

This brings up one other point, are all parents told exactly what the post-mortem reveals? Could there be some 'fudging' if a healthy baby was aborted 'by mistake'? The information I have been given from staff at the public hospital is that there is no "fudging". Moreover that very few parents give permission for a post-mortem examination nowadays.
Summary

Many other procedures and interventions in current use during pregnancy have not been examined by randomised control trials. It must be remembered that because of this there may well be under use of many interventions which might be effective. Health policy requires more than a careful evaluation of scientific evidence of the benefits and adverse effects of intervention. Health policy also requires a thorough evaluation of cost, cost effectiveness and appropriateness. What constitutes cost appropriate health care? There are different perspective's on what is appropriate health care. First the individual needs of the patient must be considered. If the outcome of a particular procedure does not alter the underlying condition and does not provide reassurance then a procedure may well be inappropriate.

In this study “the ultrasound examination” was done on well women who were pregnant. It could be argued that the examination was not designed to make them un­pregnant. Neither was the examination shown to universally provide reassurance, on the contrary in some cases. Information regarding the impact on pregnancy of ultrasound on women's needs to be ascertained. Currently we do not know on what evidence we continue to provide the service. Local conditions and the context in which the service has been established also needs evaluation.
Informed consent, safety and accuracy of results

Before attending for the scan had you been given any information about the scan?

Did anyone at the clinic tell you what the purpose of the scan was?

Has any of the information you have been given been useful to you?

Before attending for the scan thirty (73.1%) women said they had been given (useful) information which they described as either practical or clinical. Practical information was classified by the women as related to the time the scan would take, having to attend with a full bladder or the use of a gel on the skin to improve the picture. Clinical information was considered to be about the limitation of scans, ie. the scan being a measure for today but not a predictor for the future health of the baby or related to a good birth outcome. Primiparous women did not report being given more information than other women, however several multiparous women said they did not expect to be given information as they could be expected to have received this with a previous baby, and "learnt something along the way". Information which was useful was provided from the Parent's Centre antenatal classes and from midwives.

Paula I thought it was radiation so my midwife told me about the pulsed sound waves and what the purpose of the scan was, to go with a full bladder, and about the gel.

Martha Yes from my midwife. She warned me about mis-information and not to be alarmed based on what other women had reported to her. That brain cysts are not brain cysts just a normal part of fetal development just showing up on scans and being mis-reported. Also that the staff were a bit edgy because they had missed something and now they were extra careful. It would take 15-20 minutes.

Women found out later that some of the information was not entirely factual or helpful
Diana  To drink a litre of water an hour before the scan then I felt nauseated and uncomfortable, I have since found this was not necessary and I won't do it again.

And from the private consultant.

Shona  Doctor is quite honest about just how limited it is. ie. we won't have an easy birth because of the scan, there are no guarantees at all about the baby; a scan he does will not determine outcome for baby, we scan to ensure growth, liquor, and development. Yes he tells and explains everything very well. The length of the scan and heat produced that's why scans are done quickly. We do not scan inappropriately. We would not put our baby at any unnecessary risk. (Shona had 6 examinations by this stage of her pregnancy, 38 weeks).

In this study, eleven (26.8%) women reported attending for the scan with no information other than what they had seen on the television or read in popular magazines. It seemed to me that we were failing to meet the standards set out by Kirby (1983), Cartwright (1988), Beauchamp and Childress (1989), Chervenak et al. (1989), and Chervenak and McCullough (1991). Some women also complained about a lack of a good pamphlet to read on the topic and were clear that it would need to be written in plain English "not jargon or medical terminology". Information shared by clinic staff at the time of examination was most often about the weight and measurements of baby. Women were most knowledgeable about practical aspects of the examination and had least knowledge about the meaning of any results that they would receive. Midwives and Obstetricians were more likely to have told women what conditions could be detected. Information about the meaning of those results and the possibility of receiving false-positive or false-negative results was frequently omitted. None of the women in this study reported being given too much information before the scan examination.
Were you encouraged to ask questions?
Did you need to rephrase questions?
Were other people with you encouraged to ask questions?
Were questions asked by other people answered?

Just over half of the sample, twenty three (56%) women said they were encouraged to ask questions by the scan operator or that this was an irrelevant question as the operator explained the examination fully at the actual time of the scan examination.

Nora
The lady explained everything as she went, the heartbeat, size and sex.

Conversely women who were not encouraged to ask question found it pointless to rephrase questions.

Hazel
This was my 12 week scan, I knew the purpose of my visit was for dating, she said what was on the form but I knew because I told him what to write. I felt the radiographer felt this scan was a waste of her time because it was an early scan and there was really nothing for her to examine. No it was too early. She stalled just gave me the date it was due and advised me to re-book for the 18 week scan if I wanted to know more

Gina
The operator finds she performs better, concentrates when operating with the women and baby. The job is technical and perhaps other people are distracting. She was pushed for time. The verbal report at the time was that baby was a breech, but my midwife was aware that it was not. I had to get hold of the report and check this for transcription errors.

Gina had never been keen to have the examination. This added to her anxiety as she had to "chase" up the report and confirm baby's position so that she could proceed with her plan for a home birth.
Beth was so quiet said nothing. so different from the 6 week scan. A disaster really. You build yourself up and then I was hardly spoken to.

Beth only 27 years old, with no previous history of fetal abnormality was attending the routine 18 week examination in order to be reassured, as she had been at 6 weeks and to add another section to her video. Beth was looking with excitement at her fetus for the second time in this pregnancy when she found that the operator lapsed into silence. Proud (1985) recommends that ultrasound sessions should be performed by midwives and the examinations arranged to run alongside an obstetric consultant antenatal clinic so that any anomalies can be discussed with the operator and woman. The examination is always a heavy responsibility for the operator and never more so than when a fetal anomaly is found. Beth left the clinic with her two pre-schoolers in an extreme state of anxiety. Beth was told by the operator to attend for another examination on Monday to "check again" and in the meantime to call her General Practitioner if she could over the weekend. She was ill prepared for what had happened. The operator was described by Beth as "very professional and experienced". Other researchers have found that local protocol may handicap the operator from providing more information at the time or discussing any findings with the patient, for example, Beech and Robinson (1994) and Hollingsworth (1994).

On Monday Beth had a third and final examination of her baby and a diagnosis of cystic hygroma was made. The pathogenesis of some cystic hygroma visualised during ultrasound examination have spontaneously resolved prior to birth according to the work of Abramowicz et al. (1989). In other cases the baby has been diagnosed at birth with Turners Syndrome. In a report on a survey by Atkins and Hey, (1991) fifty five babies were diagnosed before birth for having 'cystic hygroma', and because of this diagnosis thirty three pregnancies were terminated. Of the remaining baby's only two survived, but three of the thirty three aborted babies were found to be perfectly normal at autopsy and the only defect in one of the others was a cleft palate. These results are in keeping with the comments by Chamberlain and Boyd (1996).
I have cared for a baby who was born with a cyst, it was situated in the neck area, just below the ear. The treatment for this was passive physiotherapy performed several times a day by the staff. Once baby was home from hospital, this physiotherapy was done by the mother. A later report from the Health Visitor, showed that apart from some restriction of movement baby was meeting all developmental milestones.

Women examined by their private obstetrician reported greater levels of satisfaction with the amount and content of information sharing and the involvement of their support people. "My husband is routinely encouraged to ask questions, and this sharing of information was central to our process of planning antenatal care". All women who were examined by the private obstetrician were given their examination results with a detailed explanation of what the result meant. Mary compared examinations at the private radiology clinic with examinations she had in a previous pregnancy.

Mary I would like to have been informed that the things the baby was doing on scan were normal. In my previous pregnancy my obstetrician had his own scan and scanned baby on most visits. He gave a list of information while scanning

Were you told when and where you would get the results?

Women were told how and when they would get the examination results, generally at the next ante natal appointment. A frequent response was that my doctor would advise of any problems and did not like the operator to relay information. Women were tolerant with this arrangement, except for

Thea I find it very important to get the information then and there. I expect to be told, not to go back to my doctor to be told, as when the placenta moved. I do not expect to wait to be told something so important
Other women held strong views about the role of the sonographer performing the examination and the limits and appropriateness of information sharing. This is interesting, as the person with probably the greatest understanding of the technology is the sonographer.

Nancy I feel the sonographer has no right to tell the woman whether the scan is "normal" or not. It is a highly inappropriate time and the sonographer is not known to the women on a professional level. If something abnormal is found I am confident the woman's lead professional could be informed promptly enough to go on to interview in this regard.

In evaluating these responses it seemed relevant to go back to why the women were attending for the examination in the first place. Thea for instance had a placenta previa, diagnosed at sixteen weeks, and was from then on seeking reassurance at all subsequent examinations that the placenta was now out of the way. Nancy attended for a simple dating examination at eighteen weeks. She did not view this as a possible threat to a normal pregnancy and birth. Nancy felt she was in no real hurry or need for the result. Obtaining the results and making meaning out of them became confusing for two of the women, even though subsequent pregnancy care was dependent on the examination. For instance Dale with a twin pregnancy, at 23 weeks experienced a sudden polyhydramnios of twin 1, with a corresponding drop in weight of twin 2 and oligohydramnios. Note the similarities here with those described by Meire (1987) and Enkin (1994) who question whether there is any real clinical value from most information because there is nothing you can do about it.

Dale Although I get scan information from the technician it is not considered "final" until we have talked to the obstetrician who "interprets" the report. So we may be told at the time that everything is all right but we continue to wait anxiously until she comes and gives us her expert opinion. The results at the time are no real help to either my husband or myself.
What Dale did not realise at the time was that the extra examinations or expert interpretations of them would not save either of the babies because there was absolutely nothing that could be done to improve their condition. More information did not equate with improved outcome. Neilson demonstrated no benefit from earlier detection of multiple pregnancies (1995). I had the opportunity to meet Dale later in her pregnancy and again after the birth. She advised me that the twice weekly ultrasound examinations showed both babies were growing satisfactorily up until thirty one weeks. At which time the ultrasound examination showed the amount of liquor of twin 2 was normal and the growth of both twins was normal. This information was reassuring for Dale, her husband and her health professionals. Suddenly and sadly at 33 weeks, twin 1 died in utero.

Laura I could not decline coming to the hospital or having the examination

Laura had been hugely inconvenienced both in family disruption and in costs when she was required to attend for further examinations in Dunedin. As Bastion (1988) observed, Laura was unable to give “informed dissent” to attend. None of the health professional were responsive to her actual reality, even though it should have been a concern to them. The everyday-ness of Laura’s situation would come under the problems that Warren (1989) has described as the “housekeeping” issues of ethics.

Three main messages that emerged from Laura’s reaction to the whole process was she doubted the reason for the examination and saw it as part of a relentless process challenging what was previously believed to be, by her, a normal pregnancy. She had not chosen to attend, but had been sent, and she could ill afford to attend. The attitude of the operator she felt was dismissive to the point of being rude. Laura quite reasonably resented the organisational and communications breakdown she encountered between the different clinic staff. She felt rather helpless in the ‘system’, and did not think the information was being gathered in a systematic way. She also doubted the quality of the examination. She was subject to very controlling and paternalistic practices.
Attitudes of the operator and the level of feedback has been found to be of the upmost importance to women (Reed, 1996) (Romero, 1993). (Campbell et al. 1982) found that in busy radiology clinics the level of feedback to women was often reduced. Sonographers also report the dilemmas they face when a problem is identified at the time of examination. Most sonographers are women and we know from intuition and from the study by Kerssens et al. (1997) that they are probably the best people to provide information to women. Sonographers can be put in impossible positions due to either time constraints or actual restrictions about how much information they can share with women. The constraints may be imposed by other health professionals who may not be as experienced in the interpretation and assessment of the obstetric ultrasound, or hold a recognised ultrasound qualification. Hollingsworth (1994) also complains about this situation when describing the role of the sonographer.

Ultrasound examinations today are conducted in real time and it is the person who carries out the scan who is best placed to judge whether a problem is present or not because hard copy ultrasound images do not always reflect what has been identified, in real time. Prenatal Diagnosis (1994, p.108).

The responses by Dale and Laura underline the fact that one of the main determining factors in women's satisfaction as a result of the process of the examination and, may be the very reason for which the examination was done. Also how dependent the future of the pregnancy will be on the information gained by the examination, and the individual coping ability of the women (Zlotogorski et al. 1995). For instance I see what happened to Laura as a problem about informed consent in that she was simply not able to say "I don't want one". I think this case exemplifies how easy it is that choice can be taken away from pregnant women, which is the situation that has been described by Bastion (1988). Paternalistic attitudes, that have protected this sort of behaviour, are increasingly being questioned by lawyers, ethicists, midwives and other interested consumer groups.
Note that Laura was advised that she should be delivered in the base hospital at Dunedin because this baby was large, (macrosomic) and that she would require the assistance of both an obstetrician and paediatrician to be safe. In the event, Laura delivered with a junior house surgeon and experienced midwife in attendance. Baby was smaller than her last baby and not macrosomic. Her husband was unable to be with her at the birth as he could not afford to take time away from work or travel to Dunedin. In my recent professional experience, Laura's situation is quite common.

**Information about the accuracy of scans**

*Do you remember ever being told how accurate or certain the results of scans are?*

*If yes, who gave you this information?*

Just over half the women, in the study, twenty-one, were told about the probability of mistakes being made (51.2%), nine women were told by their obstetrician (21.9%). Seven by the operator (sonographer) (17%) and five by a midwife (12.1%). The type of information given most often related to the weight and sex of the fetus. However, four women in the sample were neither given nor did they particularly want information relating to the accuracy of the examination results (9.7%).

**Shona** I have more or less presumed all scans are accurate never thought about mistakes other than the sex. This is not an issue for me. I trust my health professionals

**Nancy** They (the sonographers) come across as being totally confident and sure of themselves. I recall being told that the ages are very accurate to 1 or 2 days, exact length of bones. I wanted to know about the position of the placenta at different stages, the size of baby, amount of fluid, organ development and the stages of normality.

**Erin** They (midwives and doctors) say that weights are not always accurate, and the scan can miss some minor problems, and dates can be out by ten days either side.
I found women's understanding of the accuracy of the examination to be very confused. On the one hand they had been informed either by friend or health professional that one could not put too much faith in the accuracy of the examination: but for their own particular examination they were advised that it was accurate and could be relied upon. I have interpreted this as a form of deception and I believe further evidence of the paternalistic attitudes towards women as reported by Beech and Robinson (1994) and Meire (1987).

Ula My sister had a Downs baby after a scan. I heard them say it was a shame it was not picked up but it did not show, but mine (the examination) was right.

If no, would you have liked information on the accuracy of the scan?
If yes, what would you liked to have been told?

Nearly half of the sample, nineteen women, would have liked more information (46.3%). Where that information came from was not critical to them. These women also wanted any discussions to be backed up with a leaflet written in language that they could understand. If written material was provided, it would need to be written in a variety of languages. Videotapes could provide consistent information and reach marginally literate women. While a written explanation does not in itself answer any ethical problems for women it could have been a useful educational exercise. Having the opportunity to take a leaflet home and to discuss it with others, before the examination, would have increased the women's understanding of the complex nature of accuracy. The benefits to women of written information have been reported by Haire (1984). The provision of written brochures or pamphlets is also recommended in Who's Having Your Baby (AIMS, 1993).

Information that women would have liked relating to the accuracy of the examination was quite specific, for example

Leah A written report about the kidney function, fluid, spina bifida, cleft palate, length of long bones and heart rates.
Dale  The actual margins of error, % of right or wrong, but they have just to be honest with us, say how often they get it wrong

Kara  The accuracy of the abnormalities and what this means for later severity and predictions of function and health

Wendy  I am interested in the quality of checking them. Last time my dates were wrong and I was induced too early. I am a shy person and prefer not to be examined.

**Accuracy in the clinical setting**

Repeat examinations were sometimes needed to clarify fetal development

Kara  They could not see all the spine. It was not fully developed we had to go back in two weeks to be checked. I was quite worried. It would have been shattering without my husband. I thought baby could have been curled up or not as developed at sixteen weeks. But this raised issues of accuracy with me. When she said to come back in two weeks with no reference to our GP. I thought especially since it is obvious at the clinic that something is wrong and we needed another scan to check the spine again. Yes I thought this is an issue of accuracy.

Operators report that you cannot always see the spine clearly enough due to fetal position and maternal factors. Other times it may be that the dates are wrong. The next examination that Kara had was negative. This was a "true negative" in that Kara delivered a healthy baby.

Iona  From my 18 week scan I have been invited back at 20 weeks to check the spine

Martha attended for her routine scan at eighteen weeks. She had been "warned" by her midwife that the operators were a bit edgy and were being extra careful.
Despite this rather candid disclosure and appraisal of the situation Martha's experiences with five examinations over the next two weeks were deeply distressing to her.

Martha We attended for our routine scan at 18 weeks, but no measurements were made because the baby was very low and too active after about 30 minutes. I was asked to go for an hour walk, for baby to settle, all I could think was baby is low so I could go into labour and loose the baby, I did not want to loose my baby. On the second scan the baby was still wrong too many movements, I was aware of movements on the screen baby moved arms and legs, she showed us they could not get a clear picture of the heart needed to go back in the afternoon. The afternoon scan went well, took about half to one hour like the morning ones.

Martha finally left the radiology clinic after the three examinations in the one day, with the understanding that baby was fine. This feeling of confidence with her baby was soon changed when she opened her mail.

Martha When the report and x rays arrived it was the first time I knew about the bones. The report read that the baby's spine had not ossified and I had to go back for a follow up of the spine in two weeks to check. I phoned my mum and my midwife. I really thought there was something wrong. I knew ossify was to do with bones so I thought spina bifida. I said what will we do if there is something wrong with our baby. We were sad, I found I cried all the time. I did not want to acknowledge baby at work, or to talk about baby names in case something was seriously wrong. Then I came to the realisation that I had to deal with this for two weeks and I willed myself to eat and sleep properly for the baby. My mum kept saying I had beautiful healthy babies and yours will be too, that I shouldn't be worrying, bad for the baby. My midwife gave me a lot of reassurance about developmental stages, as did our family and friends.
Two weeks later Martha and her husband attended the radiology clinic again.

The third scan showed the spine was fine but she could not see the heart. She showed me but it didn't mean anything. So we had to go back in the afternoon to be re-checked for the four chambers of the heart. We thought 'why us' we just sat in the car, it was pretty horrible, it really made us stop and think.

In this case the inconsistency of the results could not be attributed to different equipment or operator. Martha thought she was in the same room with the same operator on all five examinations. The inconsistency of results had a profound emotional effect on Martha. Other negative consequences were that it also led to one examination after another, resulting in the fetus getting quite prolonged exposure. Potential problems associated with prolonged exposure to ultrasound have been raised by (Meire, 1987) (Mole, 1986) (Liebeskind et al. 1982) (Taskinen et al. 1990) (Campbell, 1982) (Haire, 1984) (Enkin et al. 1991). The term 'ossify' was simply related to a current anatomical developmental stage of the baby. It would have been unlikely to have been a condition which was going to persist and is easily misunderstood without some knowledge of embryology.

In the meantime, Martha sought support and understanding from her mother and midwife. Brink-Muinen (1997) found that most women tended to seek information from female health workers and other women. During the two weeks that she waited for repeat examinations Martha virtually suppressed her emotional attachment to her fetus, a state reported and described by Rothman (1988). Even then the reassurance that Martha was waiting for, was delayed until the second examination of the day. The social, personal and emotional cost of these four false-positive diagnoses was a considerable burden for her.
I have found no studies which examined the effects on women during pregnancy of a false positive diagnosis. A study in Sweden assessed the psychological experience of parents following false positive neonatal screening test results. This assessment was in relation to a screening procedure for congenital hypothyroidism. Out of eleven families assessed only two families had a satisfactory outcome. The other nine families experienced the whole screening procedure and information sharing process as chaotic. One effect of this was that six of these mothers spontaneously said that they had been more worried about their baby. Four were unable to breast feed as a result of this worry and two others experienced difficulties, (Fyro and Bodegard, 1988)

Colleagues who are Sonographers tell me that every new machine coming into the department shows features that they have never seen before and for which they must continually learn. This they view with a mixture of excitement and worry.

Martha The last scan was fine. My mum said without all this technology we had faith in our bodies that the baby would be fine. But the whole thing - it was ghastly really.

Dianna also attended for a routine eighteen week scan. At this examination a renal abnormality was suspected.

My husband is quite sceptical about accuracy with this technology, which has now raised issues of accuracy for me. I have to attend for a follow up scan to look at size and function of kidneys at 28 weeks. I wish she had explained how they come up with the normal range. The baby's kidneys did not adequately drain so that meant they were enlarged to the upper end of the normal range. I wondered if the extra litre of fluid I drank for the scan put a strain on the baby's kidneys. I won't drink that extra fluid next time. The scan shows the kidneys are working because baby is peeing inside you. I have read all the embryology books and more physiology books and will have to meet with the paediatricians. My GP said I might have to be induced to treat baby's kidneys. I regret having the scan. I preferred my baby the way things were.
Dianna attended for the 28 week examination which showed a 'better' renal function. Baby was born at term. At six weeks of age a further ultrasound examination showed a normal renal function and no other examinations were required. Dianna's situation shows the dilemma to be faced from findings such as mild dilation of the fetal renal pelvis. Recall that Enkin (1994) said the results of all these examinations means that no pregnancy is normal except in retrospect. This condition and the resulting dilemma, which may or may not be indicators of an underlying chromosomal anomaly has also been discussed by Meire, (1987) Beech and Robinson, (1994) Enkin et al. and (1991) Brand et al. (1994). The dilemma results from the question then raised as to whether the doctor should pursue investigations in order to investigate observed structural deviations from the 'normal range', which if unassociated with an underlying chromosomal defect, may not present complications following birth.

The effect of the antenatal diagnosis of fetal abnormality on the medical and midwifery staff has been mostly ignored in the published reports. Unless the obstetric team is aware that early delivery is not necessary for the treatment of most congenital anomalies, then the knowledge that there is an abnormal baby is very likely to promote the feeling that delivery should be sooner rather than later. This was the same feeling that Dianna reported of her GP. Then prematurity with all its hazards is liable to complicate surgical treatment even more. A paper by Griffiths and Gough (1985) drew attention to dilemmas faced by staff following a diagnosis of fetal abnormality. They used six case histories to illustrate the level of confusion and distress that can arise, and note.

Although the error-rate of scans may be low the consequences of a mistake are considerable, and if termination is advised in error, disastrous. (1985, p.624).

Of all the organ systems the genito-urinary tract has the highest incidence of congenital abnormalities. They are sometimes associated with oligohydramnious, and chromosomal defects. In one report by Atkins and Hey, (1991) two pregnancies were terminated because it was thought that the kidneys were underdeveloped but the autopsy showed no such problems. Neilson (1995), comments that examinations at
about eighteen weeks or even later allows fuller inspection of fetal anatomy, but is more complex, time-consuming and therefore more costly.

Nora  No I don't worry because of previous pregnancy scans. I don't take them too literally, I had a placenta previa before which moved by 30 weeks, so no I just don't worry.

Nora's response was in marked contrast to Dianna's. Nora had an eight week examination which was normal (negative). A repeat at twenty weeks showed twins, and a thirty six week examination showed the renal function of twin two to be poor. A repeat examination of twin two at six weeks of age showed normal kidney function. The differences in response to the situation were more in the personalities of the women and the fact that this was Dianna's first pregnancy, she had an expectation that the examination would be correct. This is in keeping with the study by Fryo and Bodegard (1988).

**Placenta Localisation**

Five (12.1%) women in this study had repeat examinations to define placenta localisation. In early pregnancy the placenta and fetus are very low in the pelvis. It may look on the screen that the woman has a placenta previa, however as the uterus grows the placenta is drawn up and out of the way of the cervix. Enkin (1994) believes that this is excessive diagnosis which results in increased anxiety and intervention for no or very little benefit. If after twenty eight weeks it remains low the woman will need a caesarean section to deliver the baby. It could be assumed that this early finding of a low placenta would alert health professional to be more aware of potential problems later in the pregnancy. Like Le Fvre et al. (1993) I could find no research to support this assumption, or indeed that early detection improved the pregnancy outcome. Two classical signs of placenta previa to aid in the diagnosis are painless bleeding and an unengaged presenting part later in the pregnancy.
Lois  My 18 week scan was normal, then I had some spotting at 23 weeks and they said "oh yes its a low placenta", but its far worse than that, and so I now have a concern about the skill level of the operator and who examines the scan result and if it could be done better.

On repeat examinations the placenta was classified to a grade 4 placenta previa, the most severe type. At thirty two weeks of pregnancy with further painless vaginal bleeding Lois was prepared for a caesarean section. However major life saving surgery was required because at the time of operation the placenta was found to have invaded the uterine muscle the cervix and the vault of the vagina, a (Placenta Percreta).

Zoe  I have had about 10 scans, I think, because of the placenta and also about 20 or 30 traces of baby which I know is also ultrasound. The 16 week routine one picked up a low placenta, then at 24 weeks it was normal. The one at 26 weeks to check the size of the baby was fine. At 27 weeks I had some vaginal bleeding-well spotting and then it showed up as a grade 2-3. These are the ones I remember the most. I had to wait for the results, except that I learned to know some of it myself.

In Zoe's opinion her examinations were operator dependent as "some scans were done at home and some in town". This situation added to her stress during the pregnancy as she found it hard to know which health professional she could believe, in the end she said she doubted everyone as a result of this conflicting advice. Oakley, (1980) Proud, (1985) and Meire, (1987) have noted that this mistrust generated at the time of the examination leads on to mistrust of the medical profession as a whole, meaning that women will question or treat with suspicion all future consultations.

I spoke with Zoe more recently and she believed the post-natal depression she suffered for the year following her baby's birth started with this stressful pregnancy. This and the fact that she felt labelled 'difficult' by the staff when she asked for results to be checked. Clearly Reed (1996) and Chervenak and Mc Cullough (1994), have not
thought of the experience for someone like Zoe when they discuss the ultrasound examination as always promoting the principles of autonomy and beneficence.

Zoe

I lost confidence in scans and the people reading them, then I heard it was the different machines or maybe a full bladder, real mixed messages and misinformation, women need to be told that scans aren't all that accurate that to have them is a choice not a duty

It has been suggested that postpartum depression, extending even into the second year after the birth, correlates with the number and invasiveness of medical interventions and the woman's feelings that her needs and wishes had been ignored. Support for this has been documented by Enkin et al. (1991). Other researchers have also demonstrated that maternal anxiety will adversely affect the baby and have long term negative consequences right up into adult life Huttunen, (1978) Torney, (1994) and Odent (1995). Moving placenta was a feature for some of the women in this study.

Gail

Yes I would like information if this is possible about moving placentas

For Gail this posed less of a problem and she was able to carry out her wishes for a home birth. The routine 18 week scan showed the placenta was close to the OS, and the GP recommended a second scan at 28 weeks, and it was normal.

Thea was booked for a caesarean section birth because the eighteen week scan showed a placenta previa and was re-confirmed on the twenty week scan. But by the thirty week clinical examination baby was found to have entered the pelvis, (engaged) a repeat scan to check on the clinical examination confirmed that the placenta had 'moved' and the operation was cancelled. Jean also had a similar experience with a moving placenta. The routine twelve week scan was normal, this was checked at twenty weeks which showed a placenta previa. Jean was then booked in for a caesarean section birth. However the check at thirty weeks showed the placenta had now moved. Moving placenta and the attendant worry for women and health professionals has been reported by Meire, (1987) Beech and Robinson, (1994) Saari -
Kemppainen et al. (1990). Jean had mixed feelings about her situation as her only previous birth experience had been by caesarean section and she had now missed the opportunity to attend birth preparation classes.

Jean: I'm poorly prepared for this now. All the antenatal classes for labour and birth preparation are fully booked, so I am somewhat disadvantaged by this mistake.

Because of the diagnosis of placenta previa Jean and Thea were classified as 'at risk'. This diagnosis was later changed when further ultrasound examinations showed in fact that the placenta was normally situated. These results are called 'false-positive' test results. Note the similarities with the Swedish study by Saari-Kemppainen et al. (1990) which found marginal placenta in fifty-three women per thousand. Jean and Thea had worried about the marginal placenta and had also been inconvenienced by the extra examinations. Recall the work about increased anxiety and interventions by Enkin (1994), Zlotogorski, et al. (1995). How the diagnosis of a marginal placenta affected the other women is missing from the Swedish study. It is only with qualitative research that you can begin to learn and understand what happens as a result of this information. In contrast Lois was given a false negative test result at eighteen weeks but went on to have the most extreme and rare life threatening condition of this sample, requiring extensive surgery.

Women with low or cervical placental implantation found early in gestation should be re-scanned between 30-32 weeks gestation. Any asymptomatic woman found to still have a low-lying placenta on ultrasound after 32 weeks should be managed as if they have a symptomatic placenta previa, by expectant conservative management. Effective Care, (Enkin et al. 1991, p.114).

With placenta previa the placenta has grown too near or even over the cervix and baby cannot be born vaginally. As the cervix starts to dilate towards the end of the pregnancy, the mother will bleed heavily. Generally there are warning signs that can be found on clinical examination but they are not always definitive. One study by
Sanderson and Milton, (1991) of placenta previa found that a more specific diagnosis, ie. 'a placenta which covers the cervical os' leads to fewer positive diagnosis, rather than the older more traditional grading of, from 1 to 4. Doctors and midwives alike, expect that test results will vary in quality and a few women also expect this. Some ultrasound test results will always contain an element of ambiguity. Conveying this fact of ambiguity, sensitively and honestly to woman is the challenge. Sample ultrasound examination results showing gestational age in weeks and full clinical examination results are included (Appendix H).

Information related to the safety of scans

Has anyone ever discussed safety issues related to scans with you?

Fourteen women in this study recalled being advised about the safety of scans (34.1%). Half of those wanting information, did so because although safety had been discussed there were some aspects about the safety of scans that they remained unclear about. This was either associated with the behaviour of the baby at the time of the scan or in later life. However this sample demonstrated very mixed attitudes and beliefs about the safety aspects of ultrasound examination.

Jill I am more worried about the danger of household sprays and garden chemical sprays that I might be exposed to and not know, than to ultrasound, therefore my husband does the roses

Whereas Jade had some slight concern based on information but this had not been reinforced by her own experiences.

Jade I have read some information in journals. My ten year old was exposed to ultrasound in utero and in my opinion is bright and healthy. It would be proper to offer unbiased information. I wouldn't want them too often due to unknown safety factors
Other women felt, that based on their own experiences they could see a cause and effect operating

Erin I had 6 or 7 scans with my last baby because of an ovarian cyst, now he is the slowest of all four of them to walk and talk. I wonder if it was the scans. I will only have more scans if there is some real indication and we are going to do something about it. This one scan is all I'm having my GP wanted more but I have refused. This is not in baby's best interest. I don't feel too bad about using a scan for a clear benefit, if its necessary, but I do mind now it can't be justified. There is some question of safety to the baby.

Anne My doctor said he scanned his wife every week so I believe it is safe.

Brook I have friends with sheep and he has scanned the baby, I think I remember her say each week since she missed her first period, so I feel it must be safe. [the ultrasound used on the farm kept for the sheep, was reported to Brook as having been used for the friend's baby]

Honor Well ultrasound does have an effect more than just diagnostic like xrays because we use it to good effect for sports medicine. It is used to disperse blood clots, reduce swelling and also prevent scarring so yes I would like to know what effects it will have on my baby"
In figure two, what women remembered being told about the safety of ultrasound is displayed in the left hand column. The issues that women mentioned most often as confusing and needing further clarification are displayed in the right hand column. Women in this study could have easily been given more information, both verbally and in written form. With more information they could have related their own concerns to the relevant explanation, which would have resulted in reduced anxiety and assisted in the process of informed consent. This would have also met the criteria of PICS as described first by Chervenak et al. (1989) and later by Chervenak and McCullough, (1991).

Some of the women in this study were seeking to understand far more specifically how the physical properties of the examination was known or thought to

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<tr>
<th>What women had been told</th>
<th>What women wanted to know</th>
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<tr>
<td>scans are very safe</td>
<td>are early scans safe</td>
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<tr>
<td>no known risks</td>
<td>are vaginal scans safe</td>
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<tr>
<td>Long scans can heat up the baby</td>
<td>how safe are scans over 30 minutes</td>
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<tr>
<td>early scans can increase the risk of abortion</td>
<td>are scans safer at specific gestation</td>
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<tr>
<td>too many scans can be damaging to hearing</td>
<td>how many scans lead to hearing loss</td>
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<tr>
<td>scans are sound waves</td>
<td>can sound damage fetal ovaries</td>
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<tr>
<td>there is no sound to the baby</td>
<td>should they look inside the head</td>
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<tr>
<td>scans are completely safe</td>
<td>is extra fetal activity stress</td>
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<tr>
<td>extra movement is in response to the scan</td>
<td>does it get into the head or mind</td>
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<td>how does it really work</td>
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be safe. I felt that even though health professionals had attempted to reassure them, suspicion was not far below the surface. A certain level of suspicion about ultrasound by women has been found by Haire, (1984) Meire, (1987) Liebeskind, (1982) Taskinen et al. (1990). Furthermore, I do think that my very question may have reminded them of unanswered queries, because most of these women then asked for verification from me about the safety of ultrasound. Although none of the women described the examination as potentially threatening, in terms of physical property, to the fetus they described a sense of protecting it from unwarranted or excessive technological intrusions. Six (14.6%) women in this study were strongly suspicious of the examination. They described fetal behaviour that they attributed to the baby disliking or perhaps being disturbed by the sound waves.

*Did you ask if your baby was a boy or girl, and were you told?*

Before the availability of ultrasound women did not know the sex of their baby until it was born. Having the baby's sex identified was seen by fourteen of the women to be an advantage because they did want to know the sex of baby before birth (34.1%). All of the women, except for Jill, were told.

**Jill**

My husband was particularly upset, would have liked to know what he had. With my epilepsy this is the only baby we are going to have and I could have got ready, phoned my mother and I couldn't tell her.

Reasons for not knowing the sex of the baby were held of equal importance to the women.

**Shona**

When you have lost babies you feel more worried. This is not a peep show. Knowing would take away the element of surprise, and because that's not an appropriate use of a scan.

**Zena**

That was the only issue at the time, whether or not we wanted to know the sex. We chose not to know, as knowing the sex seemed to build up expectations of how or what our baby would be like (even what name he
or she should have). Such expectations tend to lead to more stress and less flexibility in the post partum neonatal period; as your own expectations are more fixed. Also, don't want to tie baby into gender expectations. Also, we would have hated for the scan to have been wrong, and have felt disappointment when he/she came.

Other women were unsure about what exactly would be gained by learning the sex of the fetus. And others saw it as something to be saved for the birth day. Similar accounts of women not wanting to know in advance of the birth have been reported by Sandelowski and Jones, (1996) and Rothman, (1988).

*Was there any part of the scan examination that could have been better explained?*

Eleven women felt the scan could have been better explained, in particular the functioning and movement of the placenta (26.8%).

Thea  The placenta was low at 16 weeks, low again at 20 and then normal at 36 weeks. She said "now it has moved out of the way". How did it move and when?

Claire  I would like to know about how well the placenta is working and how this is determined

Gail  The facts about the placenta being low. I was told placenta would move upwards away from OS as 4-5 move by about 28 weeks. At 18 weeks it was too low at 20 weeks it had moved. I have gone ahead and cancelled the 28 week scan as we don't think the baby enjoyed the scan. It was trying to get away

Ada  I would like to know whether the changes noted in the placenta will cause problems to baby's growth. In my case it is necessary to have lots of scans to check on baby's growth. It will be 9 or 10 scans by delivery
Jean My point of view has been coloured by past experience. Last time I had a caesarean for a breech and I was booked for this again with a placenta previa at 12 and 20 weeks on scan, now at 30 weeks it has moved. They should give you an information sheet, one that is easily translated explaining the medical terms. With my last pregnancy I had an information sheet.

Mary All of it, however I did not ask because she is not the doctor; it is not her job to say.

Fay The operator could discuss any risks so that you are made aware

Lois As my baby did not like either the scan or heart monitor on and seemed to be getting out of the way this could have been explained to me why.

These examples showed that women wanted more information about their particular concerns. This was not just specific to women who had either false-negative or false-positive results. Some women received the message of, "I am concentrating do not disturb", from both the operator and doctors. This was at the time of examination and even later at antenatal appointments that were made because of the results of the examinations. Women voiced criticism that explanations were not forthcoming. Other studies in communication have shown on average the more information women receive, the less anxious they become (Brink-Muinen, 1997), (Zlotogorski et al. 1995). Simple explanations and time spent on reassurance is well repaid, and women report greater satisfaction with the whole procedure of antenatal care, for example Oakley (1984) and Zlotogorski et al. (1995).

Good communication is very personal because it must be appropriately tailored to the individual woman's needs. Antenatal information and whether or not women receive it has been linked in the past to social class. For instance it was found in studies by Oakley, (1984) that women of lower social class being likely to receive less
information. In this study I did not measure for social class but the woman's own educational level. However, levels of dissatisfaction with information sharing was not related to educational status for this group of women, but went across all groups. I believe the results of this study make a strong case for providing clear and accurate written information for all women. If this is done then what is not understood at the time or even remembered, can be referred to later, this has been argued elsewhere, (Haire 1984) and (Beech and Robinson 1994).

Do you think the results of the scan is going to change the care you are at present receiving from your midwife/doctor ?.

Twelve women knew their care was changed as a result of the examination (29.2%). As in Paula's case no further action because a twin pregnancy was now ruled out

Paula  Knowing the baby has long limbs explains why my uterus seems big, explains the indigestion, no need for further scans now

However for some women in the study the course of pregnancy care changed completely.

Dale  With the twins, changed from a GP to a consultant and from home to hospital. Took away future options

Wendy  The doctor has referred me to a specialist because it's a breech

Gail  Because placenta was close to OS my doctor recommended a second scan at week 28

Zoe  In my case referred to a Dunedin specialist, due to what was seen in the scan low placenta

Twenty nine (70.3%) women did not think their care would be changed in any way because of the examination, note the similarities with Meire, (1987) Mole, (1986) Newnham et al. (1993) Ewigman et al. (1993), Enkin (1994). The examination was
either routine or a maternal choice, and women were essentially going to 'see' the baby. Having the scan was just a normal part of pregnancy. Neither did women who were examined by the private obstetrician view the examination as a highly significant part of their antenatal care, but they did rate it as very enjoyable.

Fay  The obstetrician has never told me to contact him with any worries, I'm not treated as a worrying case. The examination is all routine

Gina  I cannot see why it would and I have not been told it would

Mary  It did not make any difference last time

Holly  I don't see why it should

These last remarks may be one of the keys to women's enthusiasm for the examination. They see scans as a benign procedure, which allows them to see baby early. 'Just about everyone seems to have one'. This was the point that Youngblood was making when he discussed the issue of maternal demand (1989).

**Summary**

In this section I was trying to elicit a clear picture of where, when and from whom women are given the information they need to make an informed choice about undergoing an ultrasound examination. Overall, women were most satisfied with information and the examination performed by their own obstetrician at the time of the antenatal appointment. In these cases the conditions recommended to foster the "process" for informed consent was met, recall Warren (1989), Chervenak and Mc Cullough (1991) Reed (1996) De Vore (1994). These women reported the highest levels of information sharing before and at the time of the examination. They expressed no dissatisfaction with the level of feedback.
The twenty six women who attended the private radiology clinic (63.4%) were generally satisfied with the manner in which any questions were answered when no problems were found. When problems were suspected they reported the same level of dissatisfaction as the women who attend for the examination at the public hospital. And for that last group of women this dissatisfaction was irrespective of whether any problems were suspected or not. Cambell et al. (1982) had found that hospital radiology clinic's were too busy for appropriate levels of information sharing to take place. The greatest levels of dissatisfaction was for women who were having the examination in the radiology clinic and having to remain in hospital during the pregnancy. These women reported dissatisfaction with information sharing in general even from the doctors who were looking after them. They reported that nurses and midwives gave the most information, and that information was given in a manner that was able to be understood.

This study was limited in that it only examined accuracy of the examinations from the woman’s subjective experience. However, further insight into issues of specificity and sensitivity of ultrasound examinations for the region might be obtained by studying the accounts of women such as presented in this study. Preoccupation with audit, as in past studies by Buckingham (1991), as the only valid source of evidence excludes the important evidence and experience of women. I believe that this study showed that the operator had an ethical obligation to explain to the woman the limits of the equipment and expertise and the limited clinical benefits in his/her hands. This would be far easier to do in practice if there was continuity of care from those providing the service.

Women in this study were knowledgable about the practical aspects of undergoing the examination. They were less well informed about aspects of the test that could aid decisions about undergoing testing in the first place, and preparing them for possible adverse outcomes such as being recalled for repeat examinations. None of the women could explicitly remember being told that if performed between 16-20 weeks there was a good chance of detecting a fetal abnormality. A possible
reason for this is that health professionals may wish to encourage the more positive attributes of the examination such as confirming the expected date of delivery. Ultrasound, like most other kinds of antenatal care, such as measuring the blood pressure, gives instant results. The process is happening there and then, in front of the patient. How that was managed varied from operator to operator. I believe women attended for the examination in the belief that all would be well. Women did not know that the examination was for finding fetal abnormalities. This lack of preparation had a significant psychological effect on the women who had to confront the issue of fetal abnormality. Wagner, (1994) and Enkin et al. (1991) have said how necessary it is to make provision for quality counselling for women who are put in this position.

Because adults have different learning styles, a variety of information procedures may be needed to improve the consent process. Knowledge of how ultrasound services effect Maori women needs further consideration. Maori women in particular bring to the examination prior experience with health professionals that are not necessarily positive. The results of this examination will affect the entire whanau rather than just the couple. Health professionals also need to find out the effect of this technology on women from the Pacific Islands. Thus a challenge in obtaining informed consent from women may be to ensure that prior experience, biases, family and community values are understood.
Women's experiences of the ultrasound examination

Was it easy for you to see the screen?
Were you treated in a sensitive manner?
Apart from the sonographer and support people were any other people present?
Were you introduced to them?

Thirty (73.1%) women in this study could see the screen. None of the women were physically prevented from seeing the screen. Some reported that either they or their partners could not see the screen as well as they would have liked. Not seeing the image on the screen was a universal source of complaint from women who had a vaginal examinations in the public hospital. Women thought this was because of the way the screen was positioned. In this study thirty six (87.8%) of the sample reported being treated in a sensitive manner by the sonographer, but not treated so sensitively by other staff who were present at the examination, or who "just popped in". Compare for example the contrasting accounts of these women.

Hazel

For my first scan I went with a full bladder as I was told to. [12 week dating examination] Then I was in far too much pain to climb on to the couch. She told me to empty my bladder so I thought well I will not bother again. She was great, nice and very gentle. She did her job well, measured the baby and gave me the date it was due. Amazingly caring.

The only significant dissatisfaction with the level of interaction between the woman and the operator was related to the examinations that were being performed to determine the extent of a suspected problem.

Laura

I was disappointed. She, the operator at the hospital was almost rude. She just ignored all I said, she took no notice of what I said and did not acknowledge the information I was giving her so it was next to useless to come down for it. In fact I said, 'you are supposed to be checking thoroughly because of my medical history', but this was ignored.
Not being listened to by the operator affected the way Laura went on to experience the examination and coloured her feelings about the subsequent meeting with the obstetrician. Laura was given no feedback from the operator, the film and report were sent on in a sealed envelope to the ante natal clinic by an orderly. Laura interpreted the attitude of the sonographer to be one of rudeness. Departmental policy precluded the operator from doing any more than the normal courtesies of introductions and a brief explanation of the examination. This illustrates the power imbalance between patients and staff, and medicine and other predominantly female health workers. Purdy and Holmes (1992) say that this is so ingrained and integral to the functioning of hospitals that it is not recognised by mainstream ethicists as a misuse of power. Even after I explained to Laura about hospital policies and the restrictions placed on the operator about revealing information Laura remained very critical of the 'system'. However this dissatisfaction with the ultrasound service did not get in the way of Laura's feelings towards her baby, a finding supported by Milne and Rich, (1981) and Fletcher and Evans, (1983).

Laura

I find the whole thing pretty exciting and a wee bit emotional, makes you feel very attached to the little bod inside, so this is head stuff you intellectualise as well as the emotional attachment

Six women of the study sample reported that other people were present at some point during the examination (14.6%) and for five out of the six, it was when a vaginal probe was being used. Women reported that they were not necessarily introduced to the other people walking into the room. Being introduced to other people was significant for all six women irrespective of whether it was a vagina or abdominal examination. However, the personal intimacy of the vaginal examination, with strangers in the room made the experience more uncomfortable, painful and embarrassing for the five women. According to staff who are employed at the public hospital this is not the current policy.

“For endovaginal scans we make a point of telling the woman that the door is locked. We assure the woman that nobody can barge in. We only allow people whom she has given consent to enter the room”.
The degree to which the presence of others concerned women, varied depending on their individual circumstances and experiences. When an abnormality was suspected as in Emma's case, she was quite tolerant about having others to aid in the diagnosis. My analysis of the situation was that she was in no position to refuse under the circumstances.

Emma called in a second operator. I knew why she was there, they weren't telling me but I work in health care so I have that knowledge, read the books all the time about what is going on. Well I didn't see anything on the screen, so it was worse than you imagine my pregnancy my body but the baby was affected. It had felt different to the other babies. Then they called in the doctor for more information and then a vagina scan. I did not know about vaginal probes until that day, it was all done discreetly. Then I was introduced to them all. The downside of having a scan when there is something found leaves you yucky and unsettled. You are pleased you had the scan and found out. It is that I feel for the baby, the impact is long lasting.

Emma coped very well with the unexpected vaginal examination and then the added pressure of having to have other people in the room. This ability to cope may have been, as she said, because she was familiar with the way hospitals are run. Different coping styles of women has been described elsewhere (Zlotogorski et al. 1995) However at the time none of those present counselled her in any way. Emma had to wait until she reached home before contacting her midwife and obstetrician for advice and clarification about what the scan might mean. Emma experienced similar situations to those described by Rothman (1988). Bringing others in the room was managed in a sort of covert way. For this examination to take place Emma would have been laid on her back with her pants off and her legs drawn up and knees spread apart, while the operator would have been holding the probe against her vulva and slightly into the vagina. Even with a sheet covering the woman this position puts women in an impossible situation in which to ask for any normal human rights. Women reported that it did not feel any better even when everyone in the room was looking at the monitor screen.
I interviewed Dale at twenty six weeks into her pregnancy, by that time she had already had six scans. Her first scan at seven weeks was the one she reported as being the easiest for her and her husband to watch. Unfortunately, she felt poorly prepared for what was found.

Dale Shocked at 7 weeks when the operator showed us both babies on the screen and talked about them as if we already knew. This was our first knowledge of twins, she was calm as though this happened every day and of course we both looked and thought it was pretty exceptional. Our looking at the babies was affected by all sorts of other issues like we looked and were concerned that they would both be normal babies. After that at every scan people were present and seeing our babies became a hurdle for us. Several people have walked into the room sometimes without knocking. Twice it has been Doctors who interpret the films. After the scan but we were not introduced to them. I don't know if this happens because I have been scanned so often they think I don't mind. The two most recent scans other people from radiology department came in looking for people or equipment and at the most recent one when the scan technician said "there's a student here you won't mind her sitting in will you? I'm sure you won't (is this my choice)???

According to Cartwright (1988) Davies (1985) and Bastion, (1988) this sort of behaviour to patients from hospital staff is not unusual. However, when women have raised this as an issue in the past or dared to complain the complaint has been trivialised by the hospital authorities. The experiences as reported by these women raise the contentious issue about the importance of the protection of patients rights when involving [coercing] patients in clinical teaching. The Code of Health and Disability Services Consumers' Right's now outline in right nine what steps are to be taken by health professionals when patients are involved in teaching.
In this sample of forty one women, six (14.6%) women had a type of examination, [endo or transvaginal]. The probe is always covered with a condom or placed in a plastic bag to protect against the spread of infection. Endovaginal scans are used routinely as part of infertility diagnostic and treatment procedures. Nevertheless, even some women who had been exposed to this procedure before for infertility treatment found it no easier to bear either when done as part of infertility treatment or as part of the ante natal care. All women who had vaginal probes in the public hospital during the pregnancy said there were never fewer than three people in the room and sometimes more. These women reported that this type of examination was done in conjunction with an abdominal examination.

Ella I could not always see the screen. Extra people were invited in to view the examination, [I] felt like public property. They asked if David was with me but never invited him in this would have made a tremendous difference to my stress levels. There were approximately six people in the room, the nurse seemed only one to notice I was a person with feelings. Others content to look at my genitals and the screen. My legs were spread back and propped up with towels. This was so different from Oamaru. My husband was always present there and involved - ie. holding my legs, encouragement and loving and being involved generally. This one was just not nice, totally insensitive staff.

This response showed a huge, and sad, gap between how clinical procedures are conducted in practice, and how they should take place according to agreed protocols. Many women have said that intimate procedures are performed with more sensitivity and empathy by staff in smaller hospitals. This fact is difficult to understand as it is at the large teaching hospitals that students are first trained in how to deal with intimate situations. A recent report by Jurkovic, (1995) found endovaginal examinations a useful technique for identifying and monitoring pregnancy from the very earliest stage. I can only say with certainty that the women in this study found the ways in which these examinations were arranged and then performed, to be humiliating and unpleasant.
Ella

The experience was not painful but at the changing rooms the curtains didn't meet and there was a man changing opposite from me. Then I left the changing room to walk down this corridor with an open back, bottom and body showing. Even the room was lined with rape crisis posters.

Zoe

I had one vaginal one before and that was all I needed. They [the staff] just don't think about what they are doing, insensitive, incredible. I think the doctor was learning on me by what was said but I'm not sure. The others (examinations) were an uncomfortable and painful experience with a full bladder, which by the time I had my 5th I was sick of them. They also seemed to show me that the baby was unsettled. I grew to dislike them and not want to go for them but felt I'd be letting my baby down or put it at risk if I did not go. You have to believe what you are doing at that time is really in the baby's best interest, but how do you know?

According to Rothman (1988) women who really want the baby feel obliged to go through whatever tests that are current. Because of the tremendous power imbalances still present in hospitals, ethical care remain compromised (Coney 1993), (Bunkie 1988). Zoe describes the human dynamics of her situation. The inner conflict she felt between her desire to avoid the examination and the need to be a good mother. Holmes (1992) has said this is what is meant by ordinary women who confront as "personal" there own bits of the larger "political" questions of medical ethics. She asks, "When are medical technologies truly life saving, or used because an intern needs practice" (p2).

Fay

My early scans were done in Japan and they are the most vivid. I did not know who the operator was even though they were all vaginal ones. First you go into the room and have a lithotomy sheet put up. Then (he) the operator comes in masked and gowned and does it but does not speak and leaves. No information is given at the time. The scan was disgusting / degrading. I would not want to have it done like that again must be well
like assault. It is better in Dunedin even when they are teaching the students. It was a really yucky experience they put so much gooy stuff over your abdomen and the inside. It's really yuk, then they wipe it off with the edge of the sheet from under your bottom and it drips out. Well the baby did not like the vaginal scan either moved away put his arms up to protect his head. All that pushing around certainly wakes the baby up.

Valuing women did not appear to be uppermost during this examination, recall the same concern of Holmes (1992). Intuitively one thinks that wherever possible the operator needs to be female. Recent studies have supported these intuitive feelings (Kerseens et al. 1997) and (Brink-Muinen, 1997). These studies found that most women prefer a health professional of their own sex, especially when examinations involved undressing, probing and extensive or intimate touching. Another reason given why a female health professional were preferred was because they are more easy to talk to.

There are scientific articles describing endovaginal ultrasound examinations, dating back to 1991. I could find no studies examining the considerations of this examination from the woman's perspective. With ultrasound examinations becoming more invasive and more common I would have considered it important to have found out first how women felt about this: Engelhardt (1986) has also said that the values of others need inclusion when medical technological development affects the values of people. Certainly before scheduling vaginal examinations to take place in general radiology clinics. Ten years ago Meire (1987) said that the use of vagina ultrasound is something that requires closer investigation. On the one hand we have learnt what the public hospital policy is but on the other women's experience in this study shows that policy is not always adhered too.

Women were asked to attend with a full bladder so that the operator could gain a full "overview" of the pelvis. During the first trimester scans, the ovaries are also carefully
examined and any other pathology present in the pelvis looked for. If this information can be gained using the transabdominal approach then that is all that is required. Women who are obese or who have retroversion of the uterus or ovarian cysts need the endovaginal method. Public hospital policy is for these women to have an empty bladder before the vaginal scan takes place. Women reported being told that the endovaginal probe was necessary to gain extra information but not what specific information or what action could be taken as a direct result of this extra information. It may seem negative of me to dwell on these experiences because none of us is perfect. The fact is, that by looking at our own and other forms of practice, we can find a way of working towards improvement. Furthermore this seems an extra burden for women to have to tolerate.

Zeena At my last two scans no one extra was present and I could see the screen. But with the first scan, yes, and more people were present and that was a vaginal one which was very emotional, embarrassing and very painful for me as he was being taught at the time.

I was disturbed as I listened to their accounts if the vaginal probe examination and wondered what had happened to the recommendations of the Cartwright Inquiry. For instance Zeena and Zoe reported that as well as the woman operator, they were also examined vaginally with the probe by another male operator, in training. I was also surprised that women had to guess that people were learning on them how to do the procedure. None of the women in this study having a vagina probe examination reported being asked to have a student perform the examination. Several of these accounts are in direct conflict with the rights of patients to be treated with respect, dignity and privacy and to have a support person present.

Fay and Zoe were specific in their concerns about the increased fetal movement during and after use of the vaginal probe. This has been reported in other studies. For example, David, (1975) and Lambley, (1985) have described excessive fetal movement associated with abdominal ultrasound.
While sonographers can explain and understand what is happening, no one bothered to explain this to these women. The change from abdominal to vaginal examinations makes me think that the development of ultrasound as a whole, requires a deeper examination and understanding of all the issues involved. When a health professional routinely employs a procedure, and when the government funds the procedure, there is a tendency to assume that any ethical issues raised have previously been resolved. It would seem to me that those who apply a new technology are in the best position to anticipate the potential for adverse ethical consequences. However, now after recording and reflecting on what the women have said I am not convinced that this is happening in all situations. As feminist ethicists such as Sherwin (1992) and Purdie and Holmes (1992), have said, this is because mainstream theory restrict what is counted as valid knowledge. From the accounts of Zeena and Zoe it is not surprising that Purdy (1992) doubts the adequacy of current popular principled theorists. She does not suggest that a “female-caring” approach would be any better. Rather, Purdy favours the maintenance of principles but with the inclusion of caring.

The difference between knowing and seeing.

How did you feel seeing your baby?
Is seeing different from knowing about baby?
Has seeing the baby settled any doubts or worries you may have been having?
After seeing your baby do you feel you will change any of the things you are doing at present?

Thirty three women found seeing their baby to be a positive experience (80.4%). All but one of these women considered that this was different from them knowing about the baby. Thirty two of the responses were related to a variety of things such as women's individual circumstances, the timing of the examination during the pregnancy and their own sense of how vulnerable the pregnancy was (78%).
Jill At 6 weeks you find yourself pregnant some nausea and vomiting, but once you have your scan and see it all developed. You don't imagine all this, this is more. Pregnant is pregnant about getting big and clumsy seeing the baby makes a difference. Seeing it makes a big difference. They showed me the face, heart beating at 6 weeks and the brain was developed. Every time you're pregnant you worry, you don't visualise this because you can't. This settled the doubts I had in relation to the epilepsy, and tetanus jab. But baby was very active during the scan more than normal you can even see this on the video, all that pushing around certainly wakes baby up. I wonder whether baby likes scans. This scan was important to me, as my first baby with my epilepsy. I wanted to see that all was well properly formed. The 10 week scan after slight bleeding checked also the kidneys. the six week scan saved me months of worry. I would have been worried until I had the baby. That is too long to wait, you don't know what can cause deformities. I would not have wanted then to lose a sick baby after carrying it for that length of time.

Epilepsy and early vaccinations in this pregnancy but not previous pregnancies had heightened Jill's awareness of the vulnerability during stages of fetal development. The technology and image of the scan provided her with the security and peace of mind that she was seeking. Perhaps this was an unrealistic illusion that the scan could afford certainty and perfection. Jill's account illustrates the intense concerns that pregnant women can have towards the well-being of their baby. Having early examinations coupled with high levels of feedback were found to be beneficial in reducing anxiety levels (Cox et al. 1987), (Field et al. 1985), (Levin, 1991). Seeing the image assured Jill of the 'wholeness' of her baby. This account by Jill also demonstrates what a mixed benefit the examination can be. On the one hand seeing baby compensated for the misery of vomiting, inconvenience of getting big and all those major worries of the normality of her baby. However, this reassurance was tinged with the concern she felt about the possible reason for those extra movements by baby and a feeling that baby did not enjoy the examination.
Sally  Seeing the baby was definitely positively influenced by the miscarriage last year and just moving into an older age (33). It was wonderful, brilliant, I am relieved to see the baby at 18 weeks brilliant. I am going back to see the baby at 28 to 32 weeks. I have the form and I will book that "viewing" myself. Yes I do enjoy seeing my baby puts you in touch. Seeing the face of my baby, seeing the retina and ears sticking out almost like he/she was saying hello. This has to be different from just knowing. Your own imagination about baby gets stronger, seeing it made baby more real. The heart beating and the brain all growing.

A sense of reassurance and pleasure at seeing baby was intensified for women like Sally who had suffered a previous pregnancy loss and felt themselves to be at some risk of ever having a baby. This reassurance was stronger when they were provided with high levels of feedback about the image from the operator. [The more precious the baby the more precious the image]. Other women tried to understand the image in terms of their own concrete knowledge of fetal development. They were fascinated by watching the image of their baby on the monitor.

Paula  At the routine one at 21 weeks I had this overwhelming sensation of seeing the baby look a bit like a jelly bean but with hands and feet blobs. The face and a heart beating the closest you can imagine to seeing or meeting your baby before you have him. You can "wave" to him. I would have them weekly if I could and take friends to meet baby. At 10 weeks you can see movement with no feelings so it puts you in touch with baby, this is not only nausea and vomiting. The effects of the scan on baby was to stimulate it to move more.

Honour  Reassured to see that everything was okay. Still a bit unreal. I work in a hospital and yet I still cannot imagine having a wee one in my hand even though we have a lot of babies at 34 weeks. I guess seeing our baby is a very privileged position to be in, to view my baby. There is some
prodding and poking on the wee one that I wondered about.

Women mentioned similar benefits of seeing the image to those documented by Reading et al. (1982), Sandelowski and Jones, (1996) and Reading and Cox, (1982). Many of the women in this study were also eager to be examined as were the women in studies by Beech & Robinson, (1994) and Green, (1994). Quite naturally this pleasure was tinged with some caution for the three women who were having early dating scans in preparation for amniocentesis.

Carol

It was of course good to see that all was well on the screen, pleased but uncomfortable. I did not really like seeing the baby or looking because if there had been anything wrong with it, it would have made my decision very hard. Choices are made harder because of the image on the screen, as you have seen it. This is much harder than missed periods and knowing that you might be pregnant. I instantly wanted to stop smoking, but never quite had the will power. I would like to stop. Smoking is an issue for me. I'm a one or two a day (pkt) person. Everyone else here smokes, family and friends. A scan doesn't exactly say or show how it affects baby. Seeing everything at the right size and functioning properly eases your mind, especially when smoking really makes you uneasy, so glad to see all was well.

This account of Carol's, is full of contradiction and concern. Carol exposes that tenuous link humans have between knowing something is harmful or beneficial and then being able to act on that knowledge. Early viewing of baby strengthened her bond to a baby that might, on medical advise, be terminated. This, as she described would make the choice harder. Other researchers have found the same thing (Gregg, 1993) (Fletcher and Evans, 1983) (Black, 1992) (Sandelowski and Jones, 1996). At a practical level Carol wanted to reduce her smoking. But unlike the tendency reported by Reading et al. (1982) ultrasound did not assist her in this. What Carol describes, about wanting to stop, but not being encouraged to do so by
the image of baby, is more in keeping with the later observations by Green, (1990) and Newnham et al. (1993). Similarly, no difference in smoking habits in either early or late pregnancy between screening and control groups was observed in the large study of women by Saari-Kemppainen et al. (1990).

Alice was the only woman who attended but chose not to look at the screen.

Alice I did not want to see so I simply did not look. What with a negative scan at 6 weeks and the depo injections and the wrong antibiotics I was rather stunned. This all happened in my lunch break, so at 18 weeks this was my first real knowledge that I was pregnant. I simply would not look. I did not see the baby but I believed her. This was just my lunch break and there was a baby inside.

At the time of examination Alice was in denial about the pregnancy. Later in the interview she said "with a lot of help from my mum I'm okay now about it and I'm getting ready" Alice had deliberately held back from bonding with her baby because she did not plan or want to be pregnant.

Nancy Gradual complacency with past experiences of seeing my baby. I did not experience the warm fuzzies to the same extent as last time. Pleasant to see that's all. I thought I might be having twins. I was hospitalised in the first trimester due to severe hyperemesis gravidarium and had a 6 week scan to rule out a hydatidiform mole. Now this 18 week scan rules out twins.

For other equally valid reasons routine examinations performed in late pregnancy when women were already feeling the baby move held less interest for some. The experiences were less exciting and less mysterious. Nancy was one of the few women who did say she really appreciated the ability of the examination to assist with information and a differential diagnosis, such as a mole or twins.
Leah

The image on the screen made me more aware, time to get out the clothes and prepare the room. You tend to hold back just in case, you hope all will be well. However it ceases [the holding back] as soon as you are advised the baby is developing normally. I am actually a positive person so I had not considered what we would do if we saw anything amiss. Anxiety is the predominant emotion leading up to the scan. So although I know I am pregnant because we have been feeling it move, seeing the baby makes me or forces me to do something about it. First feeling of bonding with the baby, especially with second child as you haven't really had time to think about the baby in your own mind until then, as you're to busy with your first child. Also the feelings of nesting and preparation for new baby. I thought I might be having twins at first and always nice to confirm no abnormality. It helped with peace of mind that you have a normal baby not a deformed child.

Women like Leah felt that seeing the baby could be used, rightly or wrongly, as a marker a time to get ready a framework for action. This emotional 'holding back' from the baby until it was confirmed normal was described by Rothman, (1988) as 'The tentative pregnancy'. This is a strategy used by women to save themselves any later emotional anguish. They prevent themselves from emotional attachment until examinations have confirmed the baby to be normal. Sandelowski and Jones, (1996) called the confirmation of a normal baby as 'a technological pregnancy milestone'. According to Beech and Robinson, (1994) despite this holding back of emotional attachment, women are still not necessarily well prepared for the implications of the examination. The natural process of accepting the pregnancy, imagining the baby and then learning to love it at your own pace, was felt by some women to be interfered with because of the scan.

Erin

Other women ask whether you are going to get your scan, all the time.
Like it is not enough to know you are pregnant for yourself, you have to
prove it. Because of my worries in relation to possible fetal damage caused by scan, I get rather resentful of this. While seeing the baby is nice I'm not denying that, it should not take over from what the women knows about herself. I don't need to see the baby to know about it.

Over half the sample, twenty seven (65.8) women, felt that having scan had settled doubts and worries that they had about the baby. This benefit, of a more relaxed woman, according to Field et al. (1985) and Levin, (1991) would also prove to be a benefit for the baby. A lesser number, only fifteen (36.5%) of the women said having the scan and actually seeing the baby would influence them to change aspects of their life. This finding does not support the earlier research study of Reading and Cox, (1982). However it is similar to the more recent research of Green, (1990), Saari-Kemppainen et al. (1990) and Newnham et al. (1993). These researchers looked at the effects of the examination in everyday practice when levels of feedback were not monitored, which is what I was doing in this present study. There was no significant difference between the groups of women in my sample who would or would not be making any changes as a result of the scan, irrespective of who requested the scan examination. Neither were there any link between educational groups or age, on changes in maternal behaviour as a result of the scan examination.

For those women who said seeing baby made a difference, taking better care of themselves was the change most frequently cited. For instance, "I have slowed down, just taking more care of myself, conscious of having someone else to look after". Or, "gave me more security to carry on with walking, lift my other child and increase my exercise, to keep well". The paradox is that women either increased or decreased activity levels as a way of doing the same thing, 'taking care'. This shows how reassurance from the examination affected behaviours differently although the same end was in view. The group who reported they had not changed behaviour, as a result of the scan mentioned smoking frequently, "I already take good care not to smoke and I have only decaff anyway". On the contrary from another women, "I wish I could stop smoking but the scan has not helped in this way". The group who did not change behaviour as a result of the examination rigidly maintained the previous behaviour.
Women in this study expressed knowledge of the importance of a healthy diet and smoking during pregnancy and said how they were careful about what they ate. This group of women reported that they worried about eating properly and smoking and avoided coffee, alcohol and other substances that might be harmful to the growing fetus.

Finally I want to go back to Beth's account for whom the routine eighteen week examination changed everything. Recall that Beth had her first scan at six weeks which was routine to confirm a positive urine test and showed that everything with the pregnancy was normal. This time she had her car packed for a weekend away at her parents and her children were with her. Her intention was to video the baby and take it with her. To show them, their "grandchild". The pain of this examination was all the more intense because she had already "met" and loved her baby from six weeks.

Beth

As usual I was very excited to see my baby, I went to see my baby never dreaming anything would be wrong. It felt someone had my stomach ripped out. How I got home across the traffic I can't say. I can't remember, I could not cope with driving to my parents.

As Black, (1992) has said, the experience of seeing the baby may or may not help with coping with later loss and grief. Certainly no counselling was available there and then for Beth. The need for counselling has been demonstrated by Rothman (1988), Green (1990) and Wagner(1994). Until this time the examination had always been a pleasant, social event for Beth and the family. The system certainly let Beth down at this point. As Purdy (1992) noted, we need always to take account and consider the context of each situation. Both Smith (1995) and Marteau et al. (1994) recommend the availability of non-directional counselling and support available immediately following a diagnosis of fetal abnormality. Note also the difference between the lived reality for Beth and hospital policy.
Widely differing responses show that women can hold quite different views about this technology, based sometimes, on what happens on the day, and on different values in their thinking. The relationship between seeing and knowing about the baby is different for each woman and appeared to be a very complex human phenomenon.

Can you describe, using your own words the experience of having a scan?

Over half of the sample (60.9), twenty five women, used words that described it as very positive experience. In some instances this included partners and family. The descriptions are rich and warm and show a lot of love for this new human being.

Jade I found it a very positive experience sharing it with my partner and children. It was a very special moment finding out and sharing with my son and watching my daughter, lovely. My partner especially found the scan a crucial part of his bonding with baby. We were struggling with the reality of this pregnancy for a while. This pregnancy was unplanned and somewhat of a shock, [a failed intra-uterine device]. Knowing we had a son and for them to see their brother was a special family experience.

Holly For myself a strange mixture of nature and technology which are to me at either end of the scale. A scan is something I would have imagined myself steering clear of but some unknown factor draws me to it. I felt that at 27 weeks baby was secure. Fantastic, awesome to see it moving.

Mary Wonderful brings you very close to the baby, cosier. It becomes a human being not just a lump inside and close contact for my husband and mother in law. I, (we) want to see that it is active and normally developed so reassured and I have learnt a lot about its personality.

Iona Nothing else matters while I am having a scan. Touched with the little life inside me, the heart's beating and he's jumping about inside. Focussed on the screen seeing movement. He rolled over while I had the scan and I couldn't feel him. The night before I had felt my belly heaps but felt nothing move. At ten weeks the hands and feet and little fingers were
moving. This is overwhelming just the being inside me with the heart pumping away.

As speculated by Reading and Cox, (1982) the examination could, for some women, assist with a much earlier resolution of any ambivalence about the baby. I thought this appeared to be the case for Jade. Also and perhaps just as importantly this was a positive experience for her partner. The early strengthening of maternal bonds was evident for all of these women when examinations occurred before quickening, (first feeling of baby moving) as was the case described by Fletcher and Evans (1983). For this sample of women this early bonding was brought about by getting to know the fetus as their baby because the examination presented the baby as having many attributes of a living person. The most significant attribute being a beating heart. It would appear that from participants in my study women on the whole do not now want to do without this technology. Couples in this study understood the examination and enjoyed it as a social event. Sandelowski and Jones, (1996) termed this "a time for parental appraisal and acceptance". The exception to this was a group of seven women (17%) who found the experience to be a mixture of pleasure tinged with some concern for the baby. This concern was also related to the re-emergence of issues about ultrasound and unresolved personal issues.

Erin

It is really neat to see your baby, gives you warm fuzzy feeling, comforting and reassuring. But at the back of my mind I have the feeling I might be putting my baby at risk. So this is a two way sort of ambiguity. Exciting, confirming, but I thought that the scan could be hurting or inconveniencing for baby.

Martha

Exciting at the beginning seeing the hands move then as they explained they couldn't get any measurements it became distressing. I thought I must deserve an abnormal baby. This scan brought back memories and made me think about my first baby 8 years ago. This was my punishment by God for an abortion. I am just not entitled to a healthy baby, going over those feelings I had then brought it all back.
Martha was seeking resolution to her unique situation. She had acted within the law but outside of her moral framework. Gilligan (1982) has argued that women tend to take a different approach to morality. She believes women emphasise care and responsibility rather than rules or conflicts of rights, this is what Martha was doing.

While the examination can, and did, have an anti-anxiety effect, this effect was sometimes mediated in everyday practice, because of incorrect or uncertain diagnosis. Other researchers have found the same thing, for example Hyde said of her study, "Because of the identification of structures that can not yet be deciphered there is an element of maternal suspicion about this technology" Hyde, (1986, p.588).

Six (5%) women described fetal behaviour that they felt showed baby not liking the examination. This behaviour involved excessive movement and babies putting their hands over their ears during the examination. Similar observations when ultrasound is used have been reported by David (1975) in the study examining the relationship of Doppler ultrasound and fetal activity, and in the work by Lambley (1985). The description of excessive fetal behaviour in my study was reported most often by the group of women having a vaginal examination, which further added to their dislike of the experience. Only on a few occasions did the operator manage to dispel the concern the women had about fetal movement.

I wondered if at any time you felt any: Discomfort, Pain, Anxiety, or Embarrassment, related to the examination?

Figure 3 Levels of discomfort, pain, anxiety and embarrassment.

<table>
<thead>
<tr>
<th>Nil</th>
<th>Discomfort</th>
<th>Pain</th>
<th>Anxiety</th>
<th>Embarrassment</th>
</tr>
</thead>
<tbody>
<tr>
<td>36.5%</td>
<td>29.2%</td>
<td>21.9%</td>
<td>39%</td>
<td>4.6%</td>
</tr>
<tr>
<td>(15)</td>
<td>(12)</td>
<td>(9)</td>
<td>(16)</td>
<td>(2)</td>
</tr>
</tbody>
</table>
Dale  As the pregnancy progresses the later scans are agony. A bit of an ordeal as the bed is so hard. When I have felt sick she [the operator] didn't want to know, in that she keeps scanning as though my sickness will wait till after the scan. I felt very vulnerable. She was short / terse and I definitely did not want to rub her up the wrong way. The scan is now a time of anxiety for me and Ken. I worried that if I asked too many questions she would not scan properly or tell me everything. I relied on my midwife and obstetrician to get the information.

A combination of discomfort and anxiety were felt by a number of the women. Discomfort and pain were felt in relation to the requirement of having the examination with a full bladder. For some women it was also the pressure of the transducer against the labia or in the vagina. Women said that anxiety was a natural part of pregnancy that you feel for the baby. This natural process of anxiety was heightened for some by the examination. This was true for Dale. However, over half the sample, twenty six women (63%) said that neither attending for, nor having the scan examination added to this anxiety at all.

*Has having this (or other )scan(s) raised any issues for you ?*

Thirty four women, (82.9%) thought that having a scan had raised issues for them. The issues were mostly related to two things. The quality of the examination and how people deal with adverse outcomes at the time of the examination and during the pregnancy.

Zoe  Who is the scan for? At one place I had a grade 2-3 placenta previa, scanned later and they told me the placenta had moved. Then scanned at home a week later and it was low again. I lost confidence in scans and the people reading them. Then I heard it was the different machines or maybe a full bladder. We get real mixed messages and mis-information. Women need to be told that scans aren't that accurate that to have them is a choice not a duty.
Lara Was it all worth while. The comparisons between different scans and operators are way out. Discrepancies are marked and this is important to make some decisions.

Zena That sonographers have training and support for the people part of the job. Particularly when women are losing babies and have unsupportive partners.

Note her concern for others and recall Gilligan's ethic of care (1982).

Gina For me it is the 'so what'. You would have months to stew if something is found and it will have to be dealt with at birth so why stew about it for months. Scans could cause more harm than good if something is wrong and then what if it was not?

Jade My only real worry I have is him getting tangled in the cord. As he leaps around so much on the screen during the scan.

Cord entanglement concerns were reported by Lambley, (1985). As I already have said, this has never been the subject of any vigorous research.

Summary

As in the preceding sections women responded variously to the questions. Some included their personal values and experiences while others were more selective or declined to comment. Responses were a mixture of emotion, factual and social issues associated with the ultrasound technology. A few of the women felt that it would be better not to have to confront painful realities until one had to. These women felt little gratitude for a technology that could help with emotional preparation. Some women felt sympathy for the operator, in his/her being involved in what could be an emotionally charged situation. This study showed that the personality of the individual
woman and a previous experience with ultrasound affected how well she coped with incorrect results. What the effects on women are of an unproven diagnosis, (are) on anxiety levels, is a point made by Levin (1991) and Patychuck (1985). Neither has there been any study of pre-natal stress levels [caused by not-proved diagnosis] and the subsequent rejection of babies at birth. Incorrect information did lead to confusion and then subsequent scepticism about the worth of the examination. The one very obvious thing that emerged was that even in the early part of the first trimester, when many women only had a vague notion that they were pregnant, as soon as they saw the image of the fetus on the screen it became 'my baby'.
Maternal and fetal rights

Is the term "fetal Rights" a term you are familiar with? Yes (29), 70.3%.
If yes, how do you understand this term? How, if at all, does this affect your views on the scan?
Are fetal rights made more complex because of scans? Yes (26), 63.4%.

By asking these questions of a woman during her actual pregnancy it is clear that they will touch at one of the most basic questions about human living, how to live and what to do. While society may affirm publicly and enforce in law a woman's right to an abortion, this exercise of choice could bring a woman into private conflict with her own intuitions about what is morally a right thing to do. Furthermore such issues involve deeply personal dilemmas, private choices and values. The significance of the question for any woman would be dependent or related to her whole personal and social situation as well as individual pre-existing conditions. For example a baby may be more precious having been conceived after many years of infertility than a baby conceived following a contraceptive failure. Therefore to evaluate or analyse the women's responses to specific conditions I have attempted to present what women said under those headings. Women who could be seen to have a special or particular view about fetal rights and the place of ultrasound technology in this pregnancy are brought together, although the women did not all necessarily fit neatly into any one exclusive category or group.

Pregnancies as a result of infertility treatment.

Ella I would only go to get a fairly accurate due date if I was uncertain, as I would not abort the baby if they found something wrong and that is what they are checking for at 16 - 20 weeks. This means that if a health problem is picked up there should be help available for that couple to cope. My Doctor sent me for a routine one at 18 weeks for growth and development but I did not attend because of my views.
Shona  I think it's about rights to life. Well I know one is supposed to think one can have abortions or abnormalities but for myself I would not do anything based on a scan. So no I would not let a scan make me do that. The decision would absolutely be made with myself and husband based on feelings. I understand mistakes are regularly made at scans so it would be hard to make a decision based on a scan. I have read articles about scans and do now wonder if you should have them.

These two women were able to answer these questions in a thoughtful way. It was interesting that Ella defaulted on the 18 week examination based on her "anti-abortion" views. Unlike the findings of Chitty et al. (1991) both these women displayed a clear understanding that the examination was to exclude fetal abnormalities. Shona was also struggling to resolve her feelings, between what the law allows, and what was morally acceptable to her, given the doubt she had about the accuracy and reliability of the examination. Ella and Shona displayed those characteristics that Gilligan (1982) identified in her research as women's ethic of care. This ethic of care comes about because women have different and distinctive moral reasoning.

Women who were over 35 years of age.

Polly  Fetal rights are linked to societies view of disability. Why should disabled foetuses not be supported. Scans should be to pick up and prepare not to pick up and destroy. Why not use the high tech to help people prepare to nurture these special people like babies with Downs syndrome or Spina Bifida?. These are very discriminatory signals about disability. If systems and support including money were made available, the decisions and choices, if they are, would be less difficult to make. So these are equity issues. At present in New Zealand if a cost was attached to scans, women and families who could not afford scans would then be faced with a handicap and because of our current lack of services be doubly
disadvantaged. I feel that a policy made in Academia or Government circles ignores the lived experiences of handicapped people. It is wrong to have a blanket policy which would do away with, say Downs Syndrome, which is practising eugenics, for people with one disability. This is a very narrow selective definition and that means others with handicap can live. However, some families can and do very well in spite of the obstacles put in their way. Siblings do benefit from considering others, and they then have a wider view of humanity. As we have a lack of good coordinated support services and if I knew I was going to have a child with a disability and all the right help was available it would not be an issue.

Honor said that the right for the wee one to live. I don't have the right to say that it's life should be terminated. I thought about this in the early stage and we wanted to know in advance to prepare to give it a better deal. I would not want a scan if it were to harm the wee one, but there a bit of a contradiction as we went on to have a CVS and I was prepared to take the risks that go with that for our knowledge. This was important and we did not take this lightly. It is reassuring to know some of the major problems can be picked up. Our major problem would be Downs. I would not have wanted this dumped on me at birth, so could prepare myself and family.

Polly said that the medical information gained from the examination was useful in providing the basis for a full discussion with her obstetrician. She knew she was pregnant and the technology confirmed this for her at a very early stage. She wrote at length about the issue of 'rights' being linked to social justice, and saw the decision about abortion for fetal abnormality, inextricably linked with this. Like Waldschmidt, (1992) Saxton, (1987) Hubbard, (1987) Degener, (1990) Schei, (1992), Polly recognised the potential for adverse social consequences as a direct result of scans. She wanted this fact brought out into the public arena, not left just with the professionals to discuss. The need for wider debate has been argued for by Mooney and Lange, (1993) who say that assuming the scan provides women with the opportunity to abort an affected baby is a very narrow view of benefits that could
come from the examination. However, Holmes (1992) would argue that it is the wider political and social health care system that also needs addressing. She says the lack of equity between the sexes when it comes to health care work puts extra personal pressures on women to abort because women know that they will be doing at least 90% of the hands on caring, if a baby with extra needs is born.

Honor in attending for a CVS, had already weighed the consequences of losing a baby, as a direct result of this procedure, against the possibility of having an undiagnosed Downs Syndrome baby. I felt that Honor showed her concern for the well being of her baby. By having the information from using this technology, it would if needed, assist her to care for an affected baby. As Wilson (1993) and Smith (1995) have pointed out, this is a constructive and sensible alternative to termination for many couples. It seemed to me that Honor was in a way doing exactly what Polly had suggested. She was using the scan and subsequent CVS to pick up and prepare. This type of preparation is one benefit of scans that Reed (1996) described.

A mother with personal experience of a child with special needs

Carol

A fetus to me is a living being, right from the beginning and a life has rights. So it scared me after seeing the living baby. If there were any problems it would have been a very difficult choice. If I chose to terminate it would have had great psychological effects. The possibility if I did have to make the choice. That would be a hard one related to the image on the screen. Neither of us believe in abortion but doctor did say we would have to consider the long term consequences of caring for a baby with Downs Syndrome. Downs children now live a full long life now, we already have a child in Crippled children's society with cerebral palsy and could we or would we really want to be in that position again as we are already in our 30's. Doctor was not pushy about this in fact he was very sensitive. He did make us think about the serious responsibilities and costs involved as an affected child grew up and added strain to our family. I know with the best will in the world children with disabilities are
excluded, made to feel different marginalised is the world I'm looking for.

Carol was in a very difficult position because on the one hand she held quite strong moral opinions about abortion, and on the other she was concerned that she could have another baby with some form of handicap. The feeling of obligation to undergo a termination for handicap was noted by Dallaire et al. (1995). Her experiences with her other child had led her to believe that she did not have the long term resources to cope a fact that was reinforced by her Doctor. Neither did she say that she received sufficient help from the state. It was the obstetricians who questioned her ability to cope, specifically with a child with Downs Syndrome. Evidence that the medical profession tends towards directive counselling has been cited by (Wilson, 1993); (Smith and Marteau, 1995); (Mooney and Lange, 1993), (Marteau et al, 1994), (Geller et al. 1997). It was interesting that Carol did not question whether her obstetrician was competent to speak on such relevantly moral matters, this fact has been observed by Sherwin (1992). Even though choosing to have an abortion for fetal anomaly would have interfered with her own moral integrity and may eventually altered her relationship with her other child in care. Note the similarities with the work of Schiei (1992) Hubbard, (1987) Waldschmidt, (1992) and Jones (1994) who have pointed out that it is society's focus on negative aspects of the disabled that encourages this particular "human" eugenics. The disabled simply do not live up to what our society expects of people. That this in turn affects relationships between families when one member has a disability.

Fetal anomaly diagnosed by ultrasound.

Beth For my baby it did not have to go on growing or suffer a long labour when it had grown bigger. Women should be able to have the baby they carry with faults and the state should help bring up handicapped babies. It is for the couple or woman to always choose. I am thankful there are scans as my baby would not have lived much longer. They, (the midwife and doctor) planned everything for me. This [the termination] did not please my family and made doing it pretty sad. It was planned and I was
pleased for this to happen.

Beth suffered from the disapproval and subsequent isolation from her family. She was placed in a most difficult situation as this was an unexpected abnormality, and she was given little time for consideration or reflection. The two days it took for the labour and birth were from her own report lonely and distressing. Her husband was at home looking after their other child and neither her mother or mother in law made any efforts to be with her. The fetal anomaly was diagnosed at the eighteen week examination so legally there were only two more weeks for the termination to be carried out. Sherwin (1992) and Purdy (1992) believe that the issue of abortion for feminist ethics should be considered and analysed within women's lives and community values. It is too narrow to only consider legislative and medical issues.

I felt that there was time for Beth and members of her family to have some counselling and talk through the choices available. I felt it would have been better to have delayed the procedure until Beth had the full practical and emotional support of her family. It is probable that the outcome would have been better. It has been observed before that health professionals have a tendency to be directive when counselling, for instance Marteau et al. (1994), Kerssens et al. (1997), Smith and Marteau (1995).

Recall that Emma had the ultrasound at about eleven weeks which diagnosed a cystic hygroma. Now pregnant again, "I would rather this survey be about 'that' scan because the impact was the most long lasting and far reaching, vivid in my mind. I have had three scans with this present pregnancy and everything is well with baby". The three scans in this current pregnancy was a plus for Emma insofar as she was provided with additional information about the health status of her baby and subsequently reassured and relaxed that all was well.

Emma That a baby has rights, but I'm not sure what they are. I chose to have a scan but I do not know what the baby thinks about it. I do not believe in doing things that would put my baby at risk, ie. smoking, drinking, no drugs prescribed or otherwise. Eat healthy best start that you can provide.
I do wonder if babies like scans and what they feel if they feel anything

Emma is now relating how it was for her when she attended for the termination following the ultrasound diagnosis of fetal abnormality in the previous pregnancy. The termination was carried out in the day surgical hospital.

Emma The hospital needs to be a little more sensitive to the woman's emotional state. When scans are done and an abnormality is picked up. For the termination we were lined up like sheep. No allowances made for your needs join the rest in the queue. Some of the staff's personal opinions come into the care they give you. Why can't they differentiate. The nurse lumped me in with the other women. The termination was ghastly, I was not treated well I can understand if the staff are dealing with it all the time and they are the ones that need the counselling. I feel my circumstances were different, (this was not a social abortion) and that this was not taken into account

Emma in contrast to Beth, reported that she received plenty of time and counselling to assist her and her husband make the right decision. Nevertheless she was still confused about fetal rights with the added complexity of using scans during pregnancy, when otherwise one would be doing all one could to promote the health and well being of the baby.

As Dallaire et al. (1995) has said, women such as Beth and Emma suffer from shock of the diagnosis of fetal abnormality. They both also had the suggestion put to them of a termination for fetal abnormality as the appropriate and natural course of action. Issues about whether Beth ever reached true harmony, with what happened, and the lack of psychological assistance in the form of counselling are concerns expressed by the researchers Sandelowski and Jones, (1996) Patychuck (1985) and Dellaire et al. (1995).

Beth and Emma have both now given birth to live healthy babies.
Pregnancies that were considered to be high risk and therefore closely monitored.

Dale It is about eugenic practices, about weighing up the issues and rights of the unborn and I think this is wrong and it should be left to the couple. It is a woman's choice to carry a handicapped child. The state should support her in this and make the right support available and providewhat's needed. If the scan was in the "fetus" interest always perhaps they could be routine but they are not in the interest of the fetus because if you see anything there is nothing that can be done. My husband and I are both teachers and we have taken special needs children. I do not think I could have coped with two handicapped children but talking is easy and it would be difficult to make decisions on your babies. I decided that if I went into labour at less than twenty-four weeks I wanted "not for resuscitation" then I had to check which paed was on because some of them persuade you otherwise. Then it would be so very difficult.

Ada This is related to the abortion and pro-life movement. A scan could not influence me to terminate a pregnancy. My baby is much too precious.

Both of these women were carrying very much wanted babies. Because of Dale's employment she understood the implications of having very premature twins and how this might affect their growth and development. It was quite courageous to say that she did not want her twins actively resuscitated if born at less than twenty-four weeks, as this was going against the legal rights of the babies and also the wishes of some of the paediatric staff at the hospital. However the survival chances of twins born very prematurely is less than that of a single baby. Discretion and clinical judgement on a case by case basis is usually carried out under these circumstances. Dale had been told that one member of staff would resuscitate her twins no matter what medical condition they were in at delivery. How to deal with this and stop it happening, all added to her anxiety. Further evidence of a lack of interest in women's voices or women's values as discussed by Purdy and Holmes (1992) and Coney (1993).
Gilligan, (1982) has pointed out that actions of this nature bring women into a kind of struggle with the accepted and socially valued womanly virtues of "goodness and self sacrifice". Dale felt that a termination for fetal abnormality based on an ultrasound examination was a form of socially condoned eugenic practice and she saw this differently from the issue and hazards of delivering extremely premature twins. The nuances of particular situations are, according to Purdy (1992), a pre-requisite for moral thinking and something that is missing from mainstream ethical theories.

A woman with first hand experience of working with children with physical and developmental delays and disadvantages.

Iona I have mixed feelings about termination I thought up to 12 weeks I could do it because you can but when you think it is putting on a show for you how could you -my baby put up it's hand and waved- Put on a show. But if it had major health problems it would not be moving and waving to you would it? I have known about cerebral palsy children for some years and it would be okay for me. Anything more than that and it would be hard for me I could not cope with big problems as you don't get much help. At about 10 weeks easier to deal with something being wrong and contemplate a termination. The law does not come into this. After that if something was wrong I would be willing to look after the child, I have always thought if a child was willing to have a go I would look after it. I do not know if they should be looking inside the head with the scan. You cannot pick up things like cerebral palsy.

Iona reveals how we judge situations differently because of differences in our pasts and individual experiences which are unique. A struggle between wanting to care and reality. Gilligan's, (1982) theories regarding feminine moral decision-making is illustrated in Iona's discussion when she compares what one is allowed legally and what one could do in your internal real world. Iona knew at two levels about maternal
and fetal rights. She knew a woman could arrange to undergo a termination for fetal abnormality because she told me at length about her mother's experience of this, but she also knew that this would be harder for her now she had met her baby as a real person. Like many of the other women in this study she questioned her ability to cope financially if she did have a baby with physical or developmental delay. The sparse contents of her home demonstrated that she had few socioeconomic advantages but still she felt overall she would be able to cope or at least try to. This reflects Gilligan's (1982) point, that while Iona fits the socially defined womanly virtues of goodness and self-sacrifice and knows at the same time by her work experience that society does not value children with handicap. She also is aware, that in practical terms she would receive little help, this fact has been discussed by Mooney and Lange, (1993) Martin, (1995) Schei, (1992) and Warren (1989).

Women faced with false positive diagnosis of fetal abnormality during the pregnancy.

Dianna That baby has a right to be left alone and grow, not to be poked and prodded. That if something is wrong, what will be will be. They may suggest early delivery. It would have been better for baby and me and Bruce if I did not have to spend the next five months fretting about the baby's kidneys and produce a growth retarded baby because I am so worried. Even just waiting for the next scan at 28 weeks is a long time I would have preferred to believe my baby was fine. I think I have just freaked out about this not coping. I think in hindsight I would not have had a scan. My dates I knew. No it's made things worse.

Dianna's response focused on how the baby growing inside her was affected both directly and indirectly by the results of the examination. This was a very clear example of the emotional cost to women of a false positive result from something that had been considered straightforward and routine, this is reminiscent of the work by Hubbard (1987). Dianna took the examination results very seriously in that she believed there
was a possible health problem with baby. She also experienced some guilt because of her "not coping" and the adverse effect this might be having on the baby. Note the similarities with the work of Odent on anxiety levels and the 'Nocebo Effect' (1995).

Martha This is an uncomfortable topic for me as I have a lot of guilt about my other baby. It's baby's right to live. When I had that abortion I was very young. I told no one [other than her husband] and we have spent many hours since going over it. I feel I am being punished by God and not entitled to a healthy baby. I think you do need to know that a scan is safe for baby.

Martha demonstrated in her tears and words just how deeply affected she was by her previous termination of pregnancy, and this situation stirred up those memories. She had not forgotten that she was responsible for the termination and felt a sense of guilt about it. Holmes (1992) warns that women must be clear about outcomes of all medical procedures and long term costs to themselves. It was unfortunate that in this pregnancy there were so many questionable examination results to cause her even more distress.

Nora I guess this means the fetus is an actual being in its own right. I did not feel that scans could ever be considered harmful to baby and fetal rights is an entirely different moral issue. So no if it does them no harm it is then for their advantage. Well I believe it anyway.

Nora had quite limited expectations of what the examination could predict and therefore was not so concerned about false results. In a previous pregnancy she had experienced several false ultrasound results and now took it all in her stride. Overall she viewed the technology as just one part of her pregnancy care as did many of the women in the study conducted by Sandelowski and Jones (1996). Holmes (1992) has argued that medical technology should not be used simply because it exists but only when it is truly helpful.
Two women who planned for a home birth

Gina  The scan invades the baby, I mean it did not give permission to be looked at. Of course this is so long as a child is dependent on its parents. This is the beginning of that relationship. One reason for me not really wanting a scan is that if there was a major birth defect, one that may cause some to terminate the pregnancy, I do not know if I would be better off knowing or not, as I would not terminate this pregnancy. Therefore the scan results or findings should be with the maternity notes only. A scan would simply not push me towards a termination.

Gina delayed having an ultrasound examination until thirty-two weeks. This was her way of protecting the fetal rights of her baby while at the same time acting within her own moral framework and sense of responsibility towards her baby.

Claire  That the fetus is to be treated as an individual with its own rights. I now feel I could have survived without the scan because they are for picking up abnormalities so what if it was found to be one, would it make a difference about the way we felt about the baby? We certainly wouldn't abort it, so why are routine scans suggested.

Claire's ultrasound examination took place at forty-two weeks. The examination was requested to demonstrate that baby was not suffering from post maturity in which case she could not have proceeded with her planned home birth. Sherwin (1992) is concerned that medicine has this authority to define what women may do, in this case, elect to have a home birth. Both Gina and Clare went on to have safe and satisfying home births.

Questionable results regarding placenta location.

Thea  Even though the fetus is not a person in law I consider my fetus to be my baby. A person would have difficulty agreeing to an abortion based on a
scan. However I do not hesitate to let my babe be scanned. Yes and no to control a video seems to be invasive of baby, although this is my baby. This would be insensitive to its own needs. Now I know that is not rational.

Thea saw her own intuitions and emotional relationship to baby as separate, not to do with constructed or 'man made law'. Thea's thinking is reminiscent of the work by Gilligan (1982) about women's moral development. For Thea, the ultrasound for medical reasons was necessary, as opposed to having a video of baby just for pleasure. Thea took her responsibilities towards her baby very seriously.

Failed contraception resulting in this pregnancy.

Jade The literal rights of the fetus as a human being separate from mother. A life and body separate so the maternal right as the vessel carrying baby does not dominate those rights of the fetus. I guess it would be safer if the fetus signed an informed consent form saying 'no you can't have a scan'. There are paradoxes with scans and complications with scans if you pick up a problem if it can't be treated anyway. In America some women have been charged with risking the fetus by taking drugs so this 'means there that the fetus has more rights than the mother. So no I can't give a valid answer as no baby would want a scan.

Jade highlighted the current paradox of having a technology that was able to diagnose a particular abnormality which was not necessarily amenable to treatment or cure. We have created the unusual situation of having a diagnostic test which does not always lead to a medical intervention that is in the best interests of the patient, (beneficent). Mooney and Lange (1993, p. 876) point out that "this runs counter to the normal medical view that it is only ethical to screen if effective 'treatment' is available".

Fay It's about termination, getting rid of not perfect babies, I don't approve of that. Nor does my mum. Not perfect babies are okay- we are all different.
Fay had come to understand that the ultrasound examination she had at eight weeks could well have demanded that she make the kind of decisions her mother never had to make. She was very comfortable with different levels of human potential and fulfilment. Just how involved doctors should be with women’s values and choices has been raised by the feminine ethicists Warren (1989) and Sherwin (1992).

Responses from the remaining women

Zena Although I do not know the term as such, the concept is familiar. I still wanted to have the scan, as it led to more informed choice and to me it did promote the baby as a separate person. Abortion would not be an option for me. For a health problem like cleft palate we would have been in a better position to deal with and care for baby; may have influenced my decision to return to work.

Zena valued the examination for practical reasons and for information for information's sake. Again this is another woman who may have faced difficulties if a major fetal abnormality was found. As in the studies by Mooney and Lange, (1993) not all women would freely chose to abort, even after a test has indicated that a baby is affected.

Jill Personally I do not believe in abortion. Baby has a right to live and you can take precautions. Now whether baby likes scans as when baby gets scanned it moves around a bit, the pushing around certainly wakes baby up. I am quite strong on not having abortions. I can see now it would have been difficult if the scan showed something. Baby does have a right to life and yes it would have been difficult. We didn't actually talk about this aspect at all and I don't think Steve and I ever have. And I haven't thought about this myself but I would not have an abortion so it would be difficult. You wonder what could be picked up.
Jill attended for her examination seeking reassurance that baby was developing normally and to specifically rule out abnormalities as a result of her epilepsy and having vaccinations early in the pregnancy. However, Jill and her partner were not clear about what an ultrasound could diagnose. I wondered if she could have found herself 'backed into a decision' as described in the other study by Sandelowski and Jones (1996). The paradox was she knew the risks of abnormality were higher for herself and held strong views against a termination thus possibly exposing her to feeling of guilt. This feeling of guilt was found and recorded by Dallaire et al. (1995). Furthermore, Jill and her partner had not fully clarified their own values as a couple, something that would have formed part of a quality counselling process (Brink-Muinen 1997), (Kerssens et al. 1997). So while Chervenak and McCullough (1991) believe that ultrasound improves the care and the autonomy of patients, this is not always so.

Brook A calm mother = a calm baby so a growing baby, I do not believe in abortion so finding a health problem we could see about treatment.

Brook took a very straight forward and down to earth approach, supporting the idea that it would be possible for women to improve prospects for baby by just being stress free and relaxed. This information and advice which was given quite commonly is now coming back into fashion, for example by Odent, (1995). However Brook may have been unrealistic in what treatments were actually available.

Paula I do believe in fetal rights. I know my baby and I interact all the time. I know he is mine and he is fine. I have thought that if the baby had something grossly wrong - no arms, or Anencephalic. I would want to think about that as an issue. This is because it would be difficult to care for a very disabled child in New Zealand no help available and the authorities don't support you very much. To know the early scan was important before twelve weeks an abortion cut off point. In fact New Zealand only wants healthy super babies a cultural attitude towards health and fitness and independence. And I am not sure if this is desirable as this is bad for people with disabilities.
Paula explained that she had her examination at 10 weeks as she wanted it early "just in case". This relates to the ideas put forward by Rothman, (1988) about maintaining emotional distance from the baby. Furthermore, I noted that she related issues about fetal abnormality to the wider issues in society, similar to those that concerned Patychuck (1985). Although it is a huge difference in terms of disability and viability "no arms, to Anencephalic". Paula's message was one of social justice. How society in general sees its obligation to those with disability are arguments also put forward by Wilson (1993) and Smith (1995).

Sally It's to do with fact that the fetus is at the mercy of how the mother chooses to control her pregnancy and that this may not always be appropriate. Fetal life should be considered in conjunction with maternal health. I see "right" as primarily a health issue. The scan is still fine, if there was an obvious abnormality spotted during the scan, I/we would have time to mentally prepare, how to cope with a child who might need extra care. We have just had a routine scan and not been so concerned about abnormalities. Having said that, we would not have been seeking an abortion our baby does have rights too. I am influenced by an experience of a friend who declined a scan and had a Down's Syndrome baby. So for my next pregnancy I will have an amnio because of age factors. I guess I'm a bit confused here.

Sally admitted her thinking was not clear on these issues. On the one hand she afforded her baby full rights and found the idea of a termination to be against her moral intuitions. But then would 'hedge her bets' by requesting an Amniocentesis in any future pregnancies. So I presume the actual here and now baby was for her more of an actual person and suspect that she would have difficulty going through with an amniocentesis if ever the need arose. Sally's thinking is understood and described by other researchers such as Rothman, (1988) Whitbeck, (1987) Patychuck, (1985) and Gilligan (1982).
Mary (Whether) a fetus is a person with its own rights and I believe a scan probably reduces fetal rights overall. I guess the scan is for the women’s sake not the baby. If we find something wrong baby is going to suffer. This makes me think about baby’s rights but I do not fully understand where baby starts and stops. Women still believe the scan will pick up everything even though this is not so. Some women put off believing they are pregnant, buy no baby clothes until they have had the scan, and I think too many health professionals rely on scans instead of clinical skill and use them indiscriminately. Women seem to have lost confidence in themselves to carry a healthy baby unless this is seen in the scan so the movement and kicks don’t register as much as the scan.

Mary made several salient points. Like Martin (1995) and Smith, (1995) she was clear that fetal rights were reduced by the examination, because currently we have neither the resources nor expertise available to effect fetal surgery. Mary’s description of women not believing they are pregnant, and not emotionally connecting with the baby until the scan has confirmed it for them is reflected in the study by Rothman (1988). Rothman has termed this period in the pregnancy as the 'The Tentative Pregnancy'. This is that time in the pregnancy when a woman holds off, or suspends developing the normal relationship with her fetus. This until such time as technology has pronounced the pregnancy real. Finally, Mary noticed the reliance women and health professionals placed on the scan examination to diagnose every or any problem, issues which have been raised by Illich (1975), Freidson (1972) and Cassell, (1993). Sherwin (1992) and Purdy and Holmes (1992) also argue that we should be worried about expanding medical skills leading to greater control over women’s lives.
Summary

In this section I was trying to discover how aware the women were of their moral and legal rights. I was interested to know if this included the status of the fetus as a separate person from themselves. If the advances in technology, specifically the ultrasound scan showing baby before birth has increased or decreased in women's feelings about the rights if any, a fetus may have. The law in New Zealand permits for a first trimester abortion up until 12 weeks. The procedure is carried out in Dunedin as a day surgical case with the woman having a general anaesthetic, and a technique of dilation and suction is used. Abortions for fetal abnormalities may be performed in the second trimester up until 20 weeks. The crucial difference for the woman is that she has to labour and birth her baby. Occasionally the baby will survive (just for a second or two) the labour and birth, showing some initial signs of life.

Many women in this study held strong anti-abortion views. These women were worried that if a fetal abnormality was found by the scan they could be coerced or pressured to have a termination of the pregnancy (Bewley 1992). These worries are well founded by an observed tendency for medical professionals to be directive when counselling or communicating probabilistic information. There are a few parents who hold different views to societies prevailing attitudes about the level of burden associated with disease and disability. These parents will present a challenge to counsellors who have in the past wanted to reduce or prevent the number of children born with serious disease or genetic conditions (Green 1997).
Ultrasound and technological control

Have you felt that the scan technology has given you greater control over your pregnancy? Yes (17), 41.4%.

If yes, describe how has this occurred.
15 women (36.5%) felt that the scan technology actually reduced their personal control.

Did you feel that the technology gave health providers greater control over your pregnancy? Yes (22), 53.6%.

Ella

The first scan when baby was 5 days old gave me the opportunity to plan for extra rest, time off work. Avoid chemicals and medications. The scan gave me the proof that I was complete as a woman. I was at last going to achieve motherhood. Settled all my doubts regarding infertility. We kept it secret from family for 10 days it was a special time for us to accept the changes that were going to happen and re-arrange summer holidays. I have been wanting this baby after years of infertility, now I know as well what is going on all the way and probably because of my history I ask more questions. The scan has allowed us to record it from the start. the use of scans has given me insights in to what is happening. Does give the women some control good or bad at least you know what is going on.

Ella valued the information for its own sake and also to act on, a fact as described by Mooney and Lange (1993). Information for reassurance also contributed to her sense of control. At just five days into her pregnancy Ella claimed motherhood as a special time for herself. It had already changed a lot of things for her.

Lois

I have benefited from the scan as it gave us what we call our "safe zone" for 3 months in view of a past experience when we lost a baby. We did not tell anyone except the direct family of this pregnancy until it felt safe. Knowing we were going to have this baby, I have been pleased that my doctor knows what is happening. It made me feel better about things.
Lois was very satisfied with all of the examinations. She found the information from them helpful and because of these positive feelings it improved her health during her pregnancy. In this case a previous pregnancy loss had been a devastating blow for Lois. This pregnancy did not cancel out that lost baby. The ultrasound technology and seeing the image of the baby helped her feel safe about this new baby, as did the comfort she gained from thinking that her doctors were fully informed about the development of the baby. In this case benefits from the examination were not actually realised, as a placenta percreta seen on scan, and reported by the radiology staff, was missed as significant by the clinical staff. Lois consented and went to theatre for a Caesarean Section operation because of a placenta previa. In the event she needed much more extensive surgery to save her life.

Carol  It has taught me more about my anatomy as I was never told that an IUD would contribute to infection or that the infections added to the risk of prem labour or infertility

Carol found benefits of getting anatomical information about herself from the examination. She learnt more about the risks inherent with her past choice of contraception and gained insights about premature labour and infertility. Ultrasound technology was for Carol a plus and provided her with information to act on more than just pregnancy information. These three accounts show that the use of the ultrasound takes on another dimension for women when added to other significant events. They viewed the examination not in isolation but part of wider aspects of their lives.

Gail  Because of the abnormality of the placenta close to the Os I did not quite get the pregnancy right, my body, I mean. My midwife had to send me to a consultant whom she knew favoured or "approved" home birth who could send me for a second scan which showed the placenta had moved. Then I was back to where I would have been in Denmark having a home birth anyway. Parent's Centre has also suggested these early routine scans like the one I had can in some respects not be as helpful to the women as we have come to believe. I wondered if my scan would be used for
research and who wrote the report and a diagnosis without meeting me or my baby. Then later you are given a piece of "paper". This world is medical, separate from the baby and parents. Of course the placenta was always normal—they don't move.

Laura They know what they are dealing with, they know what care to provide, but because my information was ignored this has overall been more to my inconvenience rather than the benefit it should be.

Gail noted that there seemed to no one person to identify who was in charge of her report. Because of this she could see that this technology promoted impartial decision making which was in isolation from her own individual needs. She also voiced concern about the lack of verification on the information provided to her. Mazzeo (1987) and Sherwin (1992) found a strong relationship between political power and who owns technology. Gail and Laura were disillusioned because the expected results of the technology did not show any benefits to them. Gail in particular did not feel listened to. But what was important was the element of disquiet she had in regard to the way she felt the technology had directed attention away from her account of the situation. Both of these two women had doubts about the technology being misused, thus turning a normal pregnancy into a problematic or major medical event. This point has been argued by a number of theorists who link the control of technological knowledge with power over pregnancy, for instance Whitbeck (1987), Patychuck, (1985), Foucault (1973), Illich (1975), and Oakley (1980).

Zoe Generally lost all control over my life and personal rights. If I did not want another scan I was made to feel like a naughty girl by the staff. Has anyone bothered to study the effects of scans on the baby or mother? Then I have been repeatedly traced which is also ultrasound, 20 or 30 of those which sometimes goes on for a long time. And now a vaginal probe on the ward. Taken all the joy out of this pregnancy if you think they found the placenta was low at sixteen weeks. But I was not told that this is generally so and I did worry. I would not have scans again just added to what they have already on you. I think loss of control for me has just
added to how I feel now about scans. In future I'll rely on me and my intuition more. In fact I even feel guilty about these feelings at times.

Zoe was examined at three different locations by different operators and the resulting confusion would encourage one to think about the possible benefits of a central processing and reporting facilities. She was disappointed by the lack of consistency of results and interpretation. She hated her own lack of control and involvement over matters pertaining to her pregnancy. The time in Dunedin Hospital away from her husband, family and friends was stressful and made her feel like the victim of an uncaring system. Zoe felt that her basic values and needs were continually disregarded or challenged by those caring for her. Valuing women and what women value, such as contacts with family and friends, has been argued for by Purdy and Holmes (1992). The ultrasound examinations and monitoring were viewed by the staff as providing more valid information than the information she could provide them about her pregnancy. Problems arising when technological information is viewed as superior to personal information have been discussed by Foucault (1973), Cassell (1993) and Illich (1975). All three women experienced a sense of loss of control because of the scan examination. They were in no way awed by the technology, but as Belenky (1986), has said, the women did become subject to 'external scientific authority'.

Recall that the next two women had a termination following fetal abnormality diagnosed by the ultrasound examination.

Beth  The scan has changed my perception of future pregnancies. I am very glad there are scans to have. I know more now about fetal development. The equipment is fantastic. It does not hurt you or baby. This is difficult to explain under the circumstances. It's not at all how it used to be. With previous pregnancies I had a photograph but did not see it moving.

Emma  This technology told us we had a sick baby. This allowed us to do something about it. Technology has its place. I never considered myself at high risk for abnormality. It was a terrible shock as the earlier scans had been fine
Beth and Emma were given the message from their doctors and other health professionals that termination was in their best interest, under the circumstances. Sherwin (1992) and Mooney and Lange, (1993) suggest that it is not the role of a doctor, as an agent of society, to pass this sort of moral judgement. That this is only one response to a diagnosis of fetal malformation. While I am convinced that this was done for the best possible reasons with the women’s welfare uppermost it does reveal evidence of the relationship between technology and socially reinforced power described for example by Cassell,(1993) and Illich (1975). I am mindful that Beth and Emma were grateful to have ultrasound available.

Gina Yes now I am better informed by the examination. The information should benefit the baby and woman, but what about the rules and power of the results and what is done with it. I put myself forward for a scan for the baby's and my benefit not for New Zealand statistics. It is quite personal and should be your private property. This is something I am having difficulty with because I feel quite strongly about medical power in New Zealand. With regard to moral decision making, this demands mind and body thinking and analysing. People should not tell you what to do and an abnormal scan would not push me to a termination. So what if I am told I should? I have always been difficult like this.

Information to benefit the baby and the woman correlated strongly with greater control over the pregnancy. Gina was the only woman to articulate any concerns about issues surrounding personal privacy and medical social control, issues that have been argued by Foucault (1973), Freidson (1972) and Mazzeo (1987). Gina appreciated the information provided to her from the examination. However, she was anxious that the information could be used to direct her decision making, a fact supported by the research of Smith and Marteau (1995), Kerssens et al. (1997). Support for the reason behind her anxiety can be found in the writings of Schei (1992) and Hubbard (1987). This was particularly in regard to termination of the pregnancy for reasons of fetal abnormality. For this very reason she did not agree to an examination until thirty two weeks into her pregnancy when termination would not be an option. Note that Gina
approached the problem in the same personalised and contextual way described by Gilligan (1982).

Kara Depending on what the purpose of the scan is, affects my attitude, ie in India which babies will live is based on a scan. I have no control but insights. It has enabled my care to be managed. Growth and health can be determined by scan technology and that is good for babe and the doctor to know.

Despite the mistakes that were made Kara demonstrated an amazing faith in the benefits of this technology on her pregnancy. Unsupported faith in technology has been documented in studies by Cassell (1993) and Illich (1975). Kara reported that having her husband fully informed and involved throughout the pregnancy was the main reason that she managed to cope with incorrect results and repeat examinations. Stepping back from her own concerns and looking at how this technology could be used destructively Kara could see the whole range of political control brought about by technology. Both Gina and Kara were sensitive to the fact technology has defused 'come into use' quite quickly with perhaps the moral and ethical issues being overlooked.

Jade No control for me but this was not important as I am hugely confident in this pregnancy anyway so did not need the added reassurance. There was no control to others.

There was no link at all for Jade between the relationship of medical technology and control. It was just a tool that enabled her to show the image of the baby to the rest of the family. The pregnancy was a result of failed contraception and perhaps she had come to a more realistic understanding of the benefits and or limitations of medical technology in general. Jade showed a coping style and resourcefulness that Zlotogorski et al. (1995) found resulted in reduced levels of anxiety associated with ultrasound examinations.
Claire I guess it has relaxed me about being 42 weeks with no niggles or signs of labour.

Claire was planning a home birth and so the examination results could be seen to have given her some control. However this control was needed because New Zealand society has redefined a home birth as a risky venture [There is no research evidence to support this]. The book Where to be born? by Cambell and Macfarlane (1994) is based on research in the United Kingdom. Nevertheless, the research methodology, findings and recommendations are applicable to the New Zealand setting, because of our similar health systems and population demographics.

Paula I have no control over my pregnancy except indirect control like watching my diet and exercising. They are able to inform me more accurately, ie big baby will cause more indigestion than normal. This is not necessarily only caused by twins.

This was a mistaken belief on Paula's part that keeping fit and healthy was not a direct control over the pregnancy. This demonstrated how easily women can discredit the self and put belief in the superiority of the information gained from medical technology. Sherwin (1992) and Illich (1975) believes that this fascination with the "truth" of technology, characterises a lot of our interactions with medicine. Certainly an ultrasound examination is not needed to explain the physiological mechanics, or hormonal changes, resulting in indigestion during pregnancy. Furthermore a skilled practitioner can diagnose a larger than usual baby or differentiate between twins and a large baby. Again proof of the faith in the superiority of technology as found in the work of Faucault (1973), Freidson (1972) and Cassell (1993).

Sally The scan did not give me control but I was less worried that all was going well after I'd had the scan. And yes in that this pregnancy appeared to be 'normal' for the health professionals.
Honor  You just hear out there that a lot of scans may not be a good idea but under the circumstances you are in no position to refuse are you?

I was surprised that Sally did not equate her worrying less with a corresponding rise in her level of control. Having a baby in New Zealand at forty is different from having a baby at twenty or thirty and this is what Honor was finding; that because of her age [rightly or wrongly] she could not be so carefree about her pregnancy and was subject to more medical supervision and control. On the whole, responses from these women showed a relaxed attitude to the topic, compared with

Mary  Women still believe the scan will pick up everything even though this is not so. Some women put off believing they are pregnant, buy no baby clothes until they have had the scan, I think too many health professionals rely on scans instead of clinical skill and use them indiscriminately. Women seem to have lost confidence in themselves to carry a healthy baby unless this is seen on the scan so the movement and kicks don't register as much as the scan.

Mary was the only woman to talk about the reliance that some women place on the examination to diagnose every or any problem. She described the same phenomenon which Rothman (1988) calls the "tentative pregnancy", and obviously was concerned about the passing of control from women to the 'medical system', this subsequent loss of personal control has been described elsewhere, for instance, by Illich (1975), Freidson (1972) and Cassell (1993).

Dale  The scans were hard to read and interpret but they were the only thing they had to go on. For instance for twin 2 the weights were down and there was a shortage of liquor up until 31 weeks then that came right. In all this confusion and uncertainty whatever suggestions they make I am obliged to accept. I have felt very vulnerable and not in control. This has added to it. I have to deal with things on a daily basis and you are very dependent on the operators, and then you are reliant on the information being correct. Each one is a hurdle and no one talks about the safety
topic. I will not have scans again in any future pregnancies. Overall I regret the use of this technology in my pregnancy. We can see when we read my case notes that staff are as confused as we are about what it all means. As I get further into this pregnancy I come more public property. They talk together about the positions of the babies and how they have changed. It makes me feel like a freak.

Ada I am not sure if the scan gave me control but yes to my doctors but they needed it with my history.

These two pregnancies were considered to be high risk. As such, the fullest information possible was thought to be needed to help determine management of the pregnancies. In regard to technological information and control Dale became increasingly disappointed as her ability to trust the results was eroded by different interpretations of the examinations. Dale was deeply affected by the use of this technology, this is reminiscent of the research of Whitbeck (1987) and Patychuck (1985). Dale and Ada highlight how differently women do/do not depend on a technological truth. The unreliable examination results seem to have moved Dale towards them although she still has a disrespect for pure technical power. Ada on the other hand abdicated all responsibility for the well being of her baby over to her doctor with a belief that this medical technology would prevent a repeat of her previous situation (a stillbirth). She was willing to do whatever she was told was necessary to have a healthy baby. The medical information Ada had gained by the examinations confirmed her faith in this technology. Her feeling of vulnerability increased her unquestioning trust in the health professionals and in turn decreased her autonomy.

Dale has since become pregnant and delivered a live healthy baby. During the pregnancy she declined all forms of electronic monitoring. Her health professionals were obliged to return to more traditional ways of observing the pregnancy and taking note of Dales own feelings. I wonder what impact might this have, theoretically, on how health professionals view their own skills, or if this attitude may make them review their basic clinical skill levels?
Iona's report of baby waving had confirmed that her baby was normal and well. She was uncomfortable with the rest of the procedure it was new and she had not given her agreement to the looking inside her baby. However she was not able to stop the procedure once started even though she was not convinced that she had really agreed to this level of scanning. This is failure of informed consent procedures as described by Bastion (1988) and Beech and Robinson (1994). While for Jill the ultrasound examination had increased her sense of control. She placed great faith in the fact that if her baby was fully developed at six weeks then the remainder of the development would continue normally. There was a natural desire on her part for medical technology to solve any problems and give her back some control of which her epilepsy had robbed her. In this regard seeing the anatomy of the baby in detail was a plus, which was in direct contrast to Iona's feelings.

Martha's account does raise the question of adequacy of training and audit of practice apart from the other issue of so many examinations. She acknowledged the limitations of this technology in being able to provide more control for herself. However, she was not prepared to forgo the benefits of having pictures of her baby
for the family record and tolerated considerable anxiety. Martha had several large sheets of photographs of the baby's ultrasound pictures and treasured them. Like Cassell (1993) has said, the numbers of images on film become all important. Martha and her midwife had spent hours trying to solve the problems arising out of the scan technology which showed the fetus at various stages of development.

Leah Yes I feel that scans should never be compulsory or it could be dictated that a certain sort of baby be born. We can see what happened in India. Here it would be just fit with blue eyes and slim. I feel that if there had been any abnormalities depending on what they were my husband and I would discuss and decide our options then, not prior to having the scan and its outcome. The scan did not give me more control personally but I gave myself the opportunity of having a scan so that if anything was wrong, provision may have been made to correct the problem. And I think it probably confirms their [health professionals] care for you.

Summary

There was an ambivalence about the benefits that could be gained by technology such as the ultrasound. Leah echoed the same sentiments as some of the other women and wondered about the possibility of the examination being used to eventually change our society. At the same time Leah felt encouraged by the idea, that in her case, the examination could be used to benefit the baby, and she was supportive of anything that could be done to benefit baby. Overall there was a definite perception among women of the problems foreseen by Illich (1975) and Foucault (1973).

This study demonstrated a need to safeguard women from the poor care that Martha and Ella had to tolerate. They are examples which showed how a technology could be used in a manner for which it was never intended in the first place. Or rather
the perspectives of the use of the technology may vary considerably and be dependent on the 'agenda' of the user or technician / health professional. This comes back to the original concern, that most women in New Zealand are unaware of the possibility of veiled eugenics resulting from ultrasound scanning during pregnancy. Involvement of the wider community could assist health professionals in planning for counselling services as recommended by Geller et al. (1997), Engelhardt (1986) and Sherwin (1992).

There is a demonstrated risk involved in encouraging women to look to sophisticated technology for simple answers throughout the pregnancy. Such technology may discourage women from believing in themselves and their own inner resources and intuitive and hormonal responses to the baby. These responses are important, they help develop the mothering role and strengthen women’s capacity and confidence for human connection and love. To suggest that there was no benefit to women from this technology would be absurd. But the widespread willingness to accept and fund this technology as routine is not based on sound scientific evidence.
Conclusion

The benefits of ultrasound to the women in this study have not been unequivocally demonstrated. In some cases ultrasound did enhance the understanding of their bodies and baby. In other cases health professionals and the women had an unrealistic expectation about what could be achieved by the examination. Motivation for having an ultrasound examination for many of the women in this study was not only determined by the belief that this was appropriate health care, but a deeper desire to find out more about their pregnant self and their unknown fetus. With ultrasound the professional can provide more direct access to the fetus. That is what the mother-to-be seeks. She is waiting for news, "messages from the baby within". How is my baby doing? The pregnant woman may also want to have proof or affirmation in the external world of reality of her internal world. Women displayed a familiarity with having the examination and how it was for their own benefit. They had some understanding of the indication for it and most women felt satisfied with that.

The cost of offering routine ultrasound to all pregnant women is high and the question must be asked, is this appropriate use of public money? This is particularly so when the examination has to be repeated because of poor quality examination. Non-directive counselling should also be available post-examination in the event of an abnormality being suspected (Brink-Muinen 1997, Kerssens et al. 1997). Providing counselling has considerable resource implications. Resources are needed for immediate staff training of appropriate counsellors who are fully informed and skilled in counselling (Marteau et al. 1994). Time also needs to be scheduled into appointments for counselling in the event of problems being detected. Ultimately recommendations that affect large numbers of people should not be made without regard to other health policies which must also be implemented with finite resources. Searle (1997) has said that indiscriminate use of tests in pregnancy has implications for the drain on public health resources, as has the increasing medicalisation of pregnancy.
The women in this small sample had previous knowledge of ultrasound examinations, either through direct experience or through the experience of friends or relatives and the popular press. But having some knowledge of the examination did not equate to having full information. Use of a technology like ultrasound, combined with the low educational level of some women made the process of informed choice and consent increasingly difficult. As was shown by Laura’s story, true informed consent must also require an understanding that results of some ultrasound examinations can be inaccurate. Information also has to take into account the woman's motivation for attending for the scan. This is because accuracy and interpretation of the examination vary. A diagnosis of a potential problem leads to, or requires, more examinations later in the pregnancy. It may also ruin the birth experience because of anxiety and uncertainty (Odent 1995, Enkin 1994). The quality of information provided by some health professionals, for instance nurses, midwives and obstetricians, was better than others. Having said this, there is definitely scope for a substantial improvement by all staff. Regardless of who gave the information, there was a connection between women’s understanding and the time spent in discussion.

The women in this study looked for information and knowledge from the examination as part of taking responsibility as mothers. Each woman in this study was a responsive and thoughtful person set on the course of being a mother to the baby inside her. Providing in-depth information to each woman about the examination was the responsibility of each professional. I felt that this did not happen for a number of the women. Women who did not want the examination tolerated them because they wanted to be seen to be behaving responsibly. Ultrasound examinations used for no clinical indication, (routine or on maternal demand) became a screening test. As observed by Searle (1997), high use was at the expense of informed consent. Like other screening tests they could only point to the woman or fetus being at either low or high risk of a particular condition. This gave rise to a significant number of 'false positives' and 'false negatives', and resulted in many women in this study being unduly worried or falsely reassured.
Prospective mothers in this study varied in their responses at seeing the image of their fetus on the monitor. The examination transformed the fetus from a mysterious unknown baby to one with a definite identity. This brought about its own dilemmas. For a few women, learning the sex of the baby before birth represented a "breaking the seal" a tampering with a secret. Most pregnant women know from experience that the moving fetus responds with a startle reflex to sudden loud sounds and differently to classical or rock music. It seems certain to me that the women in this study had no satisfactory information about the fetal movements they saw during the examination. For some, the extraordinary experience of being able to see the baby was ruined by a busy operator or hospital protocols. What might have been a major positive experience became a bladder-bursting endurance test, followed by a wait for results. The results of the examination were often ambiguous and involved probabilities a fact not fully disclosed to the women.

How women receive the results of the examination can be a vital part of their antenatal care. For some women to be told there and then was appropriate. For others it was perfectly acceptable to wait for the next antenatal appointment. In some cases women were misled as to what the significance was of the examination and overestimated its clinical usefulness. Sending a woman a letter asking her to 'attend again in two weeks' when a problem was suspected was the most disturbing experience and left her feeling devastated. Some of the health professionals demonstrated a need for more effective training on how to present the ultrasound examination in such a way that it would lead to informed decision making by the women. This has been strongly argued for elsewhere (Kirby, 1983 Cartwright, 1988 Beech and Robinson, 1994 Beauchamp and Childress 1989). While ultrasound examinations had the potential to be a fascinating and a happy experience, real or mistaken diagnoses of fetal abnormality did lead to psychological devastation. Midwives and doctors expect that some test results will vary in quality and some tests, such as ultrasound contain an element of ambiguity. Conveying this fact, sensitively and honestly to the women, is the challenge.
The examination raised awareness of the fetus as a separate individual. The recognition of the fetus as human, early in the pregnancy, brought complex issues relating to prenatal screening in the minds of some women. Ultrasound provides potentially threatening information about the fetus and this fact should not be treated lightly. Women need to be told about the possible consequences of the information that the examination provides. Issues of social justice were important for many of the women. They talked about the availability of the examination affecting the way society might eventually place less value on people with disabilities. Parents who choose not to abort a baby with an 'abnormality' might later feel punished by society which could regard them as 'irresponsible' or having more than their fair share of the health, education and social welfare 'purse'. It seemed to me that never before have women been placed under so many pressures.

Moral beliefs are a result of experience, education, gender and the socialisation process. Consequently, beliefs will reflect the values and moral beliefs in our culture and society. However, what women decide morally to believe must also be affected by their own interests. Even within this small group of women there was a diverse range of knowledge, motivations and self interest expressed. Numerous women said they would not want to have, or consider having, a termination for fetal abnormality based on the examination result. How far women would actually carry this out is debatable especially in the light of pressure from the health establishment to make every baby a "perfect" one. When a woman would not want to have an abortion, even if there was something seriously wrong with the baby, she should be supported in her choice not to have an ultrasound. As Gilligan (1982, p. 70) has pointed out,

this particular exercise of choice for women brings her into a struggle with the accepted and socially valued womanly virtues of 'goodness and self sacrifice'
It is mainly, but not exclusively, the feminist writers who have focused on fetal and maternal rights as being redefined and constricted by medical technology. However, they accept that this is not only a technologically created dilemma, but part of the wider issue of the power to control society by medicine. Holmes (1992) suggested that increased medical technology brought more power and control over patients. This was because the information provided only an illusion of control to patients, and that in reality it further constricted behaviour. Engelhardt (1986) warned that technological innovations could produce not only the changes they were intended to effect, but also lead to consequences which can be unexpected and for which human beings were unprepared. Technology has evolved and diffused quickly into practice, thus over-looking the ethical issues related to its development. Now that this technology is so much part of accepted practice we appreciate why the ethical questions have eventually asserted themselves.

To present a narrow focus on rights issues could prevent me from seeing or addressing some of the wider issues about technological power. One could question whether the utilisation of this technology might encourage women to have a termination that they might not otherwise undertake. Another way of looking at this issue has been suggested by the feminist ethicist Warren (1989). She maintained that ideological conflicts and values could be ignored when it was advantageous for the state to do so. Values that women and families hold can be changed to conform to the political agendas because of the practical realities of life, such as inadequate funding for the care of handicapped people. The influence of a woman's religious belief on the issue of maternal and fetal rights also needs to be considered. The law is only one form of influence on, and regulator of, private behaviour. Comments from women indicated that their own moral intuitions and those of their family and peers played an equally important role when confronted with a possible termination of an affected fetus. Green (1997) has also raised the unsettling question of parental autonomy and perhaps conflicting obligation of parents not to genetically harm one's child.
The women indicated there was no strong link between more scans resulting in more perceived control for either themselves or the health professional. However, some women who had examinations earlier in the pregnancy did say that early decision making could be easier rather than later in the pregnancy, so I take this to be a sense of control. Seeing the baby was thought by some to add to a sense of control. A few women in this study needed the ultrasound to legitimise self knowledge, this is something that Rothman (1988), warned about. Women's ways of knowing about themselves and society's intuitive wisdom regarding pregnancy have been extended by Foucault's (1973) "clinical gaze of medical science".

Ultrasound examination has become more or less a routine component of antenatal care during pregnancy. The examinations are offered and recommended by health professionals and in some instances women themselves request the "scan" examination. This medical technology has provided women with the opportunity to see the baby often, long before she could otherwise know for sure that she was pregnant. In the past women could only relate to the baby in terms of feelings, fantasy and imagery. A woman can now know the sex of her unborn baby and other physical characteristics such as its length and weight if she chooses to. Scans therefore, with the ability to show each individual woman the image of her baby, has altered forever the understanding of pregnancy. They are part of a technological rite of passage for pregnant women (Floyd-Davis 1992).
Midwives are aware that women and their partners encounter difficult and demanding ethical decisions during pregnancy which are as a direct result of an ultrasound examination. This fact is not fully discussed in the literature. Therefore, women having a scan may not be appropriately prepared. Only women in a select group, classed as high risk for carrying a fetus with major anomalies are offered counselling routinely at the time of chorionic villus sampling or amniocentesis rather than women having routine ultrasound examinations. It is important for all health professionals to remember that, while they regard the examination as a way of searching for problems, this study showed that women are usually looking for reassurance that their baby is normal. Many of the women in this study were not fully informed about the advantages and disadvantages of this procedure in regard to the number of false positive and false negative results, nor about the decisions they might have to face.

The most compelling warning about the role of medical care during pregnancy comes from Sherwin (1992). She noticed that much of the expenditure on women's health during pregnancy actually go to the men who developed the technology and use it. She also claimed that the commercial health industry with its accent on advertising and subtle deception seeks only to increase revenue. The use of ultrasound during pregnancy is both a political and emotive topic. Babies represent the future of a nation and the production of healthy babies has become a political issue. The provision of ultrasound has been defined 'politically' as an appropriate and essential part of pregnancy care, this is irrespective of the many doubts about the true benefit of a scan and the concern about the costs involved.
1. References


DEPARTMENT OF HEALTH & HUMAN SERVICES

June 15, 1995

Mrs. M.E. Oakley
72 Signal Hill Road
Dunedin
Otago
NEW ZEALAND

Dear Mrs. Oakley:

This is in response to your letter, requesting diagnostic ultrasound information.

From a medical standpoint, ultrasonic fetal scanning is generally considered safe, and should be used without hesitation when clinical benefit is expected. But Ultrasound energy delivered to the fetus cannot be regarded as innocuous (harmless). Viewed in this light, exposing the fetus to ultrasound with no anticipation of medical benefit is not justified. Therefore, it is believed that prenatal entertainment videos should not be performed. For detailed information on this subject read the enclosed document titled "Important Information about Ultrasound Equipment Used in Making Prenatal Videos for Entertainment".

Training guidelines for sonographers are currently being developed by the American Medical Association (AMA), Society of Diagnostic Medical Sonographers (SDMS), American Institute of Ultrasound in Medicine (AIUM) and various interested specialty colleges. Federal and/or State training requirements for sonographers are not mandatory at this time. Information on SDMS and AIUM is enclosed.

In addition, I have enclosed information concerning National Electrical Manufacturers Association (NEMA). NEMA is the principal U.S. national trade association for manufacturers in the electrical industry. NEMA’s Diagnostic Imaging and Therapy Systems Division represents about 95% of domestic manufacturers. The Food and Drug Administration (FDA), NEMA, AIUM and other medical societies developed a voluntary standard for ultrasound output display and associated user controls.

In response to your concern regarding, “quality assurance programmes” and “false positive and false negative scan examinations”, read the enclosed articles titled:

1) Quality Assurance for Real-Time Ultrasound Equipment
2) Effect of Prenatal Ultrasound Screening on Perinatal Outcome.

If you need additional assistance, please write to our letterhead address or call (301) 443-6597, ext. 120, (800) 638-2041, ext. 120 or FAX (301) 443-8818.

Sincerely Yours,

Walter Snesko
Division of Small Manufacturers Assistance, HFZ-220
Office of Health and Industry Programs
Center for Devices and Radiological Health

Enclosures
BACKGROUND INFORMATION ON FETAL KEEPSAKE VIDEOS

The FDA has become aware of several enterprises in the U.S. that are commercializing ultrasonic imaging of fetuses by making "keepsake" videos. In some cases the ultrasound machine may be used for as long as an hour to get a video of the fetus. We are concerned about this misuse of diagnostic ultrasound equipment.

Ultrasound is a form of energy used for many purposes in industry and medicine. Obstetricians routinely use ultrasound imaging to check the size, location, number or age of fetuses in the womb, the presence of some types of birth defects, and fetal movement, breathing and heartbeat. At somewhat higher exposure levels, given daily for weeks at a time, ultrasound is used to speed the healing of bone fractures. At much higher exposure levels, ultrasound produces a heating effect in tissue which is useful in treating sprains and pulled muscles.

From a medical standpoint, ultrasonic fetal scanning is generally considered safe and is properly used when medical information on a pregnancy is needed. But ultrasound energy delivered to the fetus cannot be regarded as completely innocuous. Laboratory studies have shown that diagnostic levels of ultrasound can produce physical effects in tissue, such as mechanical vibrations and rise in temperature. Although there is no evidence that these physical effects can harm the fetus, public health experts, clinicians and industry agree that casual exposure to ultrasound, especially during pregnancy, should be avoided. Viewed in this light, exposing the fetus to ultrasound with no anticipation of medical benefit is not justified.

Persons who promote, sell or lease ultrasound equipment for making "keepsake" fetal videos should know that FDA views this as an unapproved use of a medical device, and that we are prepared to take regulatory action against those who engage in such misuse of medical equipment.
Appendix  A

December, 1993

Dear Sir/Madam,

Routine Ultrasound Scanning during Pregnancy

We should like to call your attention to the attached two extremely important scientific papers published this fall. Both papers report on large randomized controlled trials which, as you know, is by far the most valid of all scientific methods.

The American paper has been carefully evaluated by the National Institutes of Health in Washington DC and there can be no question of the results: This paper shows that there is no benefit from routine ultrasound scanning of all pregnant women and the authors recommend that there be no further routine scanning.

The second paper reveals the possibility of serious risks associated with routine scanning. As you will see, the experimental group with intensive scanning had over one-third more cases of intrauterine growth retardation. Clearly, more research needs to be done to determine whether or not such a serious risk exists, but the authors of this paper recommend that for the present time there be no more routine scanning.

It is fair to say that at the moment the best research shows no benefit from routine ultrasound scanning and the real possibility of a serious risk. Added to this are questions of costs. We have data from Member States showing that they spend more money on ultrasound scanning during pregnancy than on all other health services for pregnancy combined.

For all of these reasons, we urge you to reconsider all present policy with regard to routine ultrasound scanning during pregnancy, based on these important scientific papers.

Yours sincerely,

Mark S. Tschekovski
Director
Disease Prevention and Quality of Care

Ends: as mentioned
Dear Martin,

You may recall I wrote to you in 1993. This was in regard to a study I was conducting into ultrasound scanning during pregnancy. At that time you sent me three very helpful papers, with your authorship. Ultrasound Introduction, Basic Physics, Applications (pp19-22). Ultrasound Part 11: Doppler Ultrasound and Safety (pp13-16). Ultrasound Part 111: Exposure Parameters (pp19-22). I am now writing to ask if you could advise me which journal/book these are published in, so that I may accurately cite this material in my theses.

The other reason I am writing to you again, is to ask if the National Radiation Laboratory has formulated a policy on a national quality assurance programme for ultrasound use during pregnancy. This would be particularly as a response to the December 1993 World health Organization letter drawing attention to the Ewigman and Newnham papers.

I would also welcome any comments the laboratory may have on the current New Zealand situation in regard to "scans" during pregnancy. Do we have for instance any national statistics on the rates of false positive and/or false negative examinations?. Do all ultrasound operators have to demonstrate competency levels to anyone?. Your answers to these specific issues would be important for me to have, so that I can fairly and faithfully report the Laboratory's stance in my research report. In return I could offer to supply you with a copy of my study report. However I should add this is a very modest effort.

I trust you do not mind me writing to you again and can find the time to reply.

Yours sincerely

Mrs Maggie Oakley
8 March 1995

Mrs Maggie Oakley
72 Signal Hill Road
Opoho
DUNEDIN

Dear Maggie

Thankyou for your letter of 5 March. I am pleased that you found my articles useful, as I was a little concerned at the time of writing them that they were trying to squeeze too much information into too small a space. They were published in *Radiation Protection News and Notes*, Part I in no. 16 (October 1991), Part II in no. 17 (January 1992) and Part 3 in no. 18 (April 1992).

I would like to clarify the Laboratory's position with respect to ultrasound. At present, we have no legislative or regulatory function in this area, but can act in advisory capacity if requested. Following requests made by clinicians using diagnostic ultrasound, we have developed some equipment which enables us to measure the output parameters (power, intensity) from diagnostic ultrasound scanners. The purpose of these measurements is to determine where the exposures at the normally used settings lie in relation to what are believed to be "safe" limits, and to find how the output varies as the control settings are changed. (This is by no means as obvious as you may think!) Ultimately, these findings may be used to decide whether there should be more regulatory control. However, any decision on that is a long way off. We have no power to enforce a policy on quality assurance in ultrasound.

You may find this surprising, in view of the Laboratory's work in formulating quality assurance guidelines and codes of practice for the x-ray side of diagnostic radiology. However, this work stems directly from the Laboratory's powers under the Radiation Protection Act. This Act applies only to ionizing radiation (x-rays, gamma rays etc) but not the so-called non-ionizing radiations such as ultrasound. Changes to the Act have been proposed (but not yet been enacted) which would extend its scope to include non-ionizing radiation, but specific regulations would have to be drafted before any controls could be put in place.

At present, quality control and competence in ultrasound are the province of the professional bodies involved, such as the Royal Australasian College of Radiologists (RACR) and the Australasian Society of Ultrasound in Medicine (ASUM), and (increasingly) bodies who undertake accreditation inspections of radiology departments such as Telarc and the New Zealand Council on Health Care. However, there is a requirement that sonographers have the internationally recognised Diploma of Medical
Ultrasound. Enclosed are copies of some ASUM policy statements, which may be of interest to you. For more information, I feel it would be better for you to contact the professional bodies involved. The New Zealand branch president of ASUM is:

Nigel Anderson  
Christchurch Women's Hospital  
885 Colombo Street  
Christchurch

and the New Zealand branch chairman of the RACR is:

Christopher Feltham  
The X-ray Centre  
P O Box 596  
NELSON

Nigel Anderson has also done a lot of work in recent years to investigate the sensitivity and specificity of ultrasound in detecting fetal abnormalities, and would be able to answer some of your queries in that respect.

I am afraid that I have not been able to give you much assistance, but I do suggest that you get in touch with ASUM and the RACR. Nevertheless, I would be interested in receiving a copy of your study report when it is available.

Yours sincerely

Martin Gledhill  
for Director

Encl
Midwifery is a profession concerned with the promotion of women's health. It is centred upon sexuality and reproduction and an understanding of women as healthy individuals progressing through the life cycle.

Midwifery is: dynamic in its approach; based upon an integration of knowledge that is derived from the arts and sciences; tempered by experience and research; collaborative with other health professionals.

Midwifery is holistic by nature, combining an understanding of the social, emotional, cultural, spiritual, psychological and physical ramifications of women's reproductive health experience; actively promoting and protecting women's wellness; promoting health awareness in women's significant others; enhancing the health status of the baby when the pregnancy is on-going.

Midwifery care is delivered in a manner that is flexible, creative, empowering and supportive.

Midwifery care takes place in partnership with women. Continuity of midwifery care enhances and protects the normal process of childbirth.
Information Sheet
"Women's subjective experience of ultrasound scanning during pregnancy"

Many women have an ultrasound scan during pregnancy to help the doctor or midwife follow the progress of the baby. However, not much is known about how women feel about the experience. To find out about this a survey is being carried out by a Dunedin midwife.

If you are pregnant and interested in taking part in this survey contact Maggie Oakley, (03) 4737752. She will arrange a suitable time to give you the survey form and a self addressed, stamped envelope. The survey asks you a series of questions and gives you the opportunity, using your own words, to describe how you feel about having the "scan". This will take about 10 minutes of your time.

From the information given by you and other women it should be possible to describe women's experience of having a "scan". This is something that has not been studied to date.

Taking part in this study is voluntary and deciding not to take part will in no way affect you or your baby health care. The information collected will be confidential, this means no material will be recorded which could identify you. Once the study report is written a copy can be sent to you if you so wish. In which case you will need to give Maggie a way of getting in touch with you.
Appendix D

Consent Form

"Women's subjective experience of ultrasound scanning during pregnancy"

I understand this study is to find out how women feel about the experience of having an ultrasound scan. I have read the information sheet for women volunteering to take part in this study. I have had the opportunity to discuss this study and ask questions which have been answered to my satisfaction.

I understand that taking part in this study is voluntary and that I may withdraw my consent at any time and this will in no way affect my future health care or that of my baby or family. I understand that the information collected in this study is confidential and that no material which could identify me will be used in any reports. I understand I can have a copy of the report of this study if I so wish.

I Hereby consent to take part in this study.

Date Signature

Midwife: Mrs M E Oakley (03) 4737753

Study Number : Wishes copy of report: Yes/No.
### Appendix E

**Distribution Location of Study Information Sheets**

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<th>Location</th>
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</tr>
<tr>
<td>Hospital Antenatal Clinic</td>
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<td>Independent Midwifery Rooms</td>
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<td>Oamaru Centre</td>
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## Nuptuality

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</tr>
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<td>Gravida three</td>
<td>20.9%</td>
</tr>
<tr>
<td>Gravida four and more</td>
<td>16.3%</td>
</tr>
</tbody>
</table>
Appendix G

A short profile of the study participants at the time of interview.

01 Anne: 29 years old, in her first pregnancy. First ultrasound examination at 10 weeks, interviewed at 18 weeks, total examinations 2. Examination performed at the private radiology clinic. Completed a polytechnic course.

02 Beth: 27 years old, mother of two children. First examination at 6 weeks interviewed at 19 weeks one week following the procedure for termination, total number of ultrasound examinations 3. First two examinations performed at the private radiology clinic. A fetal anomaly was diagnosed by the ultrasound examination. Obtained school certificate.

03 Carla: 30 years old, in her first pregnancy, she had treatment for infertility. First ultrasound examination at one week, interviewed at 37 weeks, total examinations 11. All examinations were performed at the public hospital. Left school without school certificate.

04 Dale: 29 years old, mother of two other children. First examination at 6 weeks revealed a twin pregnancy, interviewed at 26 weeks, total number of examinations 6. First examinations at the private radiology clinic but subsequent ones at the public hospital. Pregnancy considered to be high risk and therefore closely monitored A qualified teacher.

05 Ella: 30 years old, had treatment for infertility. First examination at 1 week, interviewed at 36 weeks, total examinations 7. Examinations performed by the sonographer at the rural hospital. Left school without school certificate.

06 Fay: 25 years old, had two miscarriages. She is the mother of three children. First examination at 8 weeks interviewed at 22 weeks, total examinations 6. All examinations performed at the public hospital. Obtained school certificate.
07 Gina: 26 years old, mother of one child. First examination at 32 weeks interviewed at 33 weeks, total number of examinations 1. Examination performed by sonographer at the rural hospital. Tertiary qualifications.

08 Hazel aged 33 years, had 3 other children. First examination at 12 weeks interviewed at 32 weeks total examinations 1. Examinations performed at the private radiology clinic. Left school without school certificate.

09 Iona: 24 years old, mother of one child. First examination at 10 weeks interviewed at 19 weeks, total examinations 2. Examinations performed at the private radiology clinic. Obtained school certificate.

10 Jean: 26 years old, mother of one child. First examination at 20 weeks, interviewed at 21 weeks total examinations 3. Examinations performed at the private radiology clinic. Polytechnic qualification.

11 Kara: 32 years old, mother of one child. First examination at 16 weeks interviewed at 34 weeks, total number of examinations 3. Examinations performed at the private radiology clinic. University qualifications.

12 Lois: 23 years old, Mother of one child. First examination at 18 weeks interviewed at 33 weeks, total number of examinations 6. First examinations at the private radiology clinic subsequent ones at the public hospital. Left school without school certificate.

13 Mary: 35 years old. Mother of one child. First examination at 12 weeks, interviewed at 18 weeks, total number of examinations 3. Examinations performed at the private radiology clinic. Had a university qualification.

14 Nora: 29 years old. Mother of one child, this was a twin pregnancy. First examination at 8 weeks, interviewed at 30 weeks, total number of examination 6. Examinations performed at the private radiology clinic. Had a tertiary qualification.
15 Polly: 37 years old. Mother of one child. First examination at 9 weeks, interviewed at 15 weeks, total examinations 3. Polly was the only woman I interviewed before she had felt her babies movements (quickening). All examinations were performed by her obstetrician. Had post graduate qualifications.

17 Shena: 38 years old, had treatment for infertility. Mother of two children. First examination at 8 weeks, interviewed at 38 weeks, total number of examination 6. Examinations performed by her obstetrician. Had a polytechnic qualification.

18 Thea: 32 years old. Mother of two children. First examination at 16 weeks, interviewed at 22 weeks, total number of examinations 3. Examinations performed at the private radiology clinic. Had a tertiary education.

19 Ula: 18 years old. This was her first pregnancy. First examination at 18 weeks, interviewed at 38, total examinations 2. Examinations performed at the private radiology clinic Left school without school certificate.

20 Wendy: 20 years old. Mother of one child. First examination at 18 weeks, interviewed at 38, total examinations 2. Examinations performed at the private radiology clinic Left school without school certificate.

21 Zoe: 26 years old. Had two previous miscarriages. First examination at 16 weeks, interviewed at 36 weeks, total number of examination 10. Examinations performed at both the rural and Dunedin public hospitals. Had a tertiary education.


23 Brook: 31 years old. First pregnancy. First examination at 18 weeks, interviewed at 37 weeks, total examinations 1. Examinations performed at the private radiology clinic. Had obtained school certificate.
24 Claire: 26 years old. Mother of two children. First examination at 42 weeks, interviewed at 42 weeks, total examination 1. Previous treatment for infertility. Examinations performed at the private radiology clinic. Obtained school certificate.

25 Dianna: 30 years old. First pregnancy. Interviewed at 19 weeks, interviewed at 19 weeks, total examinations 2. Examinations performed at the private radiology clinic. Had a university education.

26 Erin: 30 years old. Mother of three children. First examination at 7 weeks interview at 18 weeks, total examinations 1. Examinations performed at the private radiology clinic. Had a polytechnic qualification.

27 Gail: 32 years old. Previous termination of pregnancy and no live children. First examination at 18 weeks, interviewed at 36 weeks, total number of examinations 2. Examinations performed at the private radiology clinic. Had a tertiary education.

28 Holly: 34 years old. Mother of one child. First examination at 27 weeks, interviewed at 31 weeks, total examinations 1. Examinations performed at the private radiology clinic. Left school without school certificate.

29 Jade: 30 years old. Mother of two children. This pregnancy was a result of failed contraception. First examination at 8 weeks, interviewed at 33 weeks, total examinations 2. Examinations performed at the private radiology clinic. Had a tertiary education.

31 Laura: 31 years old. Previous termination of pregnancy at 17 years. Mother of one child. First examination at 21 weeks, interviewed at 39 weeks, total number of examinations 4. Examinations performed at both the rural and Dunedin public hospitals. Obtained school certificate.

32 Martha: 29 years old. Had a termination of pregnancy at 21 years. First examination at 18 weeks, total 5 over two weeks. interviewed at 23 weeks. All Examinations performed at private radiology clinic. Tertiary qualification.
33 Nancy: 28 years old. Mother of two other children. First examination at 18 weeks, interviewed at 20 weeks, total examinations 2. Examinations performed at the private radiology clinic. Had a university education.

34 Paula: 24 years old. This was her first pregnancy. First examination at 10 weeks, interviewed at 29 weeks, total examination 2. Examinations performed at the private radiology clinic. Had a university education.

35 Rona: 19 years old. This was her first pregnancy. First examination at 19 weeks, interviewed at 23 weeks, total examinations 4. Examinations performed at the private radiology clinic. Left school without school certificate.

36 Sally: 33 years old. This was her first pregnancy. First examination at 18 weeks, interviewed at 26 weeks, total examinations 1. Examinations performed at the private radiology clinic. Had a tertiary education.

37 Zena: 28 years old. Expecting her first baby. First examination at 18 weeks, interviewed at 25 weeks, total number of examinations 3. Examinations performed at the private radiology clinic. Had a tertiary education.

38 Alice: 22 years old. Pregnancy as a result of a failed intrauterine contraceptive device. First pregnancy. First examination at 6 weeks, interviewed at 37 weeks, total number of examinations 3. Examinations performed at the private radiology clinic. Obtained a school certificate.

39 Carol: 36 years old. Previous treatment for infertility. Mother of four children. One of her children is in residential care for unspecified physical and developmental difficulties. First examination at 9 weeks in preparation for an amniocentesis. Interviewed at 29 weeks, total examinations 3. Examinations performed at the private radiology clinic. Obtained a school certificate.
Emma: 27 years old. Her last pregnancy ended in a termination for fetal abnormality, (cystic hygroma). Mother of two live children. The interview is related not to the current pregnancy, but to the examinations with the previous pregnancy. First examination with that pregnancy was at 11 weeks and the termination was carried out within the same week. Examinations performed at the private radiology clinic. Had a polytechnic qualification.


Jill: 27 years old. Mother of four other children. First examination at 6 weeks, interviewed at 18 weeks, total examinations 3. Examinations performed at the private radiology clinic. Left school without school certificate.

Leah: 28 years old. Mother of one baby. First examination at 19 weeks, interviewed at 23 weeks, total examinations 1. Examinations performed at the private radiology clinic. Obtained school certificate.

I am grateful to all the women who agreed to talk with me. I want to thank them for their openness and readiness to discuss matters that were often of a private nature and in some instances quite painful experiences.
**APPENDIX H**

**RADIOLOGY NUMBER:**

**By previous scan**

**FETUS:**

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</tr>
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<td>Vertex</td>
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<tr>
<td>Twin</td>
<td>Breech</td>
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**Cardiac Action**

- Stomach
- Kidneys

**Spine**

- Lower Limbs

**Heart/Lungs**

- Upper Limbs

**Diaphragm**

- Breathing Movement

**Abdomen Wall**

- General Movement

**MEASUREMENTS:**

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<tr>
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<td>mm</td>
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<tr>
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**C.V.S. performed by**

**Amnio performed by**

**No. of attempts**

**Amount of liquor**

**Condition of liquor**

**MEASUREMENTS:**

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>CRL/BPD</td>
<td>69</td>
<td>mm</td>
</tr>
<tr>
<td>B.P.D. (a.c.)</td>
<td>48</td>
<td>mm</td>
</tr>
<tr>
<td>FL</td>
<td>23</td>
<td>mm</td>
</tr>
<tr>
<td>AC</td>
<td>23</td>
<td>mm</td>
</tr>
<tr>
<td>OFD</td>
<td>260</td>
<td>mm</td>
</tr>
<tr>
<td>HC</td>
<td>27</td>
<td>mm</td>
</tr>
<tr>
<td>Fetal Weight</td>
<td>1.0</td>
<td>kg</td>
</tr>
</tbody>
</table>

**PLACENTA:**

**AMNIOTIC FLUID VOLUME:**

**UTERINE ABNORMALITY:**

**ADENEXAL ABNORMALITY:**

**COMMENT:**

**Quality:**

- OK

**Abnormality:**

- Buenet cord