

**A GROUNDED THEORY STUDY OF MIDWIVES' DECISION-MAKING:  
USE OF CONTINUOUS ELECTRONIC FOETAL MONITORING ON  
LOW RISK LABOURING WOMEN**

Submitted by  
**Janene Rattray, BHSc(N).**

A thesis submitted in partial fulfilment of the requirements of the degree of  
Masters of Midwifery (Research)

**School of Nursing & Midwifery**

**Faculty of Health Sciences.**



**Australian Catholic University**

Research Services  
Locked Bag 4115  
Fitzroy, Victoria 3065  
Australia

Date of Submission: 27/11/2006

## **STATEMENT OF SOURCES.**

This thesis contains no material published elsewhere or extracted in whole or in part from a thesis by which I have qualified for or been awarded another degree or diploma.

No other person's work has been used without due acknowledgment in the main text of the thesis.

This thesis has not been submitted for the award of any degree or diploma in any other tertiary institution.

All research procedures reported in this thesis received the approval of the relevant Ethics/Safety Committees.

Signed:\_\_\_\_\_ Janene Rattray 27/11/06

## ACKNOWLEDGMENTS

Thank you, to the many people who played an important role in the development of this thesis, especially the midwives who participated in the study and my supervisors Dr Karen Flowers and Sandra Miles, who provided a supportive learning environment for me during the course of this study. Without these people, completing this thesis would not have been possible.

I would also like to thank all my family and friends for their continued support and understanding, in particular my children, Michelle and Daniel, my parents, Dorothy and Jim Collings and Mervyn Martin and most of all my precious husband, Lindsay. You have all been part of this thesis by default, yet you have contributed in many ways. Thank you for your patience, encouragement and love.

*'I can do all things through Christ, who strengthens me.'*

Philippians 4:13.

## ABSTRACT

Many midwives continue to use Continuous Electronic Foetal Monitoring (CEFM) on low risk women in labour, despite overwhelming clinical evidence that it is unnecessary. The use of CEFM on low risk labouring women has been linked to rising rates of medical intervention during labour and birth with no improvement in long term neonatal outcomes.

This study examined the decision-making processes of midwives who used CEFM on low risk labouring women. Whilst a number of previous studies have examined various aspects of CEFM, none specific to midwives' decision-making and CEFM on low risk labouring women. This study contributes to the literature in this specific area.

The theoretical origins of Symbolic Interactionism and Grounded Theory (GT) methods underpin this study. SI, a sociological theory that emphasises meaning in human interactions and behaviours is used in this study to focus on the behaviours and interactions of five midwives'when deciding to use CEFM on low risk labouring women. Primary data were collected by conducting unstructured interviews and systematic analysis was undertaken using GT methods to generate a substantive theory of: *Midwives' CEFM decision-making despite evidence based guidelines.*

The midwives made the decision that led to CEFM at two key points in the woman's labour care. Firstly, during the initial assessment of the woman and foetus, some midwives decided to use a baseline CTG rather than intermittent auscultation (IA). Secondly, following initial assessment, the midwives made an individualised assessment and decided whether to use CEFM as the method to monitor the foetus during labour. Trust was identified as the core variable, having a profound effect on the midwives' decision-making at these two points. Another significant factor that impacted on decision-making was staff workload.

Recommendations relating to these findings promote that labouring women be central and intimately involved in decisions about foetal monitoring. Workplace reforms, such as the introduction of midwifery led models of care for women within a community setting are recommended to address professional trust and workload issues. Through the implementation of these recommendations it is expected that midwives will embrace the notion of *woman centred* care and that the unnecessary use of CEFM on low risk labouring women will be reduced.

# TABLE OF CONTENTS

Statement of Sources .....	ii
Acknowledgments .....	iii
Abstract .....	iv
List of Tables .....	viii
List of Figures.....	ix
List of Abbreviations & Definition of Terms .....	x
 <b>CHAPTER ONE: INTRODUCTION .....</b>	 <b>1</b>
<b>INTRODUCTION .....</b>	<b>1</b>
The Research Problem .....	2
Reason for the Study .....	3
Study Aim .....	5
Local Context .....	5
<b>BACKGROUND .....</b>	<b>6</b>
The Labour and Birth Journey.....	6
The Role of the Midwife .....	11
Accountability and Regulation of Clinical Practice.....	15
Decision-Making and Foetal Monitoring in Labour .....	17
Foetal Monitoring .....	19
Rationale.....	19
Methods of Foetal Monitoring .....	20
Historical Perspectives .....	24
Impact of foetal monitoring methods on labour and birth.....	26
Choice of foetal monitoring method .....	28
Background Summary.....	29
<b>ORGANISATION OF THE THESIS .....</b>	<b>30</b>
<b>CONCLUSION .....</b>	<b>31</b>
 <b>CHAPTER TWO: LITERATURE REVIEW .....</b>	 <b>32</b>
<b>INTRODUCTION .....</b>	<b>32</b>
Literature Search Strategies .....	34
<b>FOETAL MONITORING .....</b>	<b>34</b>
Intermittent Auscultation (IA).....	35
IA or CEFM .....	36
Efficacy of CEFM.....	39
Interpretation of CEFM.....	42
Foetal Blood Sampling.....	42
The Admission Trace .....	43
Low Risk Labouring Women and CEFM .....	44
Evidenced Based Clinical Practice Guidelines .....	44
Barriers to implementing evidence based research and guidelines.....	46
Summary of Literature Review Findings on Foetal Monitoring.....	51
<b>CLINICAL DECISION-MAKING.....</b>	<b>52</b>
Summary of Literature Review Findings on Decision-Making.....	54
<b>SUMMARY .....</b>	<b>55</b>
 <b>CHAPTER THREE: METHODS .....</b>	 <b>56</b>
<b>INTRODUCTION .....</b>	<b>57</b>
<b>RESEARCH APPROACH .....</b>	<b>58</b>

Grounded Theory .....	59
Data Sources .....	60
Theoretical Sampling .....	61
Constant Comparison .....	61
Substantive Theory .....	63
<b>DATA COLLECTION</b> .....	64
Data Sources .....	64
Primary Data.....	65
Recruiting Participants .....	65
The Participants .....	68
Participant Demographics .....	69
Interview Process .....	71
Conducting the Interview .....	72
<b>DATA ANALYSIS</b> .....	73
<b>THEORY BUILDING</b> .....	78
Discovering the Central Category .....	81
Refining the Theory .....	84
<b>MAINTAINING RIGOUR</b> .....	86
<b>ETHICAL CONSIDERATIONS</b> .....	88
Ethics Approval.....	88
Confidentiality .....	89
<b>SUMMARY</b> .....	90
 <b>CHAPTER FOUR: RESULTS</b> .....	91
<b>INTRODUCTION</b> .....	91
<b>MIDWIVES' DECISION-MAKING ABOUT CEFM, DESPITE EBCPG</b> .....	95
<b>THE MIDWIVES' DECISION-MAKING ENVIRONMENT</b> .....	95
Risk Management .....	96
Medical Dominance .....	98
Training medical officers and medical dominance .....	100
Structure of the Decision-making Environment in Summary .....	103
<b>DECISION-MAKING PROCESSES</b> .....	103
Actions .....	105
Gathering Baseline Information .....	105
Deciding to do a Baseline CTG.....	106
Undertaking Individualised Assessment .....	107
Categorising according to the Midwife's Judgement of Risk .....	108
Deciding to Use CEFM .....	109
Summary of Actions.....	110
Interactions .....	111
The Core Category: Trust.....	111
Trusting in Policy.....	112
Trusting in CTG Technology .....	114
Trusting in Others.....	117
Trusting in 'Woman' .....	121
Trusting in Clinical Judgement .....	123
'Interactions' Summary .....	127
Interruptions.....	127
Workloads .....	127
Consequences .....	132
Consequences for Women.....	133
Limited Choices .....	133

More Interventions .....	134
Feeling Reassured.....	134
Summary – Consequences for Women .....	135
Consequences for Midwives .....	135
Feeling in Control.....	135
Feeling Safe .....	136
Summary – Consequences for Midwives .....	136
Consequences - Summary .....	137
Paradigm Process in Summary.....	137
<b>CONCLUSION .....</b>	<b>137</b>
 <b>CHAPTER FIVE: DISCUSSION .....</b>	 <b>139</b>
<b>INTRODUCTION .....</b>	<b>139</b>
<b>CLINICAL DECISION-MAKING .....</b>	<b>140</b>
<i>Recommendation One</i> .....	151
Trust .....	150
Trust between Staff .....	151
<i>Recommendation Two</i> .....	154
<i>Recommendation Three</i> .....	155
Trust and Decision-making .....	154
Clinical Judgement.....	156
<i>Recommendation Four</i> .....	158
Level of Clinical Experience.....	157
<i>Recommendation Five</i> .....	160
Evidence Based Practice .....	159
Woman Centred Decision-making and Informed Choice .....	160
<i>Recommendation Six (a)</i> .....	161
<i>Recommendation Six (b)</i> .....	164
<i>Recommendation Seven</i> .....	165
Risk Management and Decision-Making.....	165
<i>Recommendation Eight</i> .....	169
<i>Recommendation Nine</i> .....	172
Workloads .....	173
<i>Recommendation Ten</i> .....	174
<b>SUMMARY OF RECOMMENDATIONS .....</b>	<b>175</b>
<b>IMPLICATIONS OF THIS STUDY .....</b>	<b>177</b>
Implications for Clinical Practice.....	177
Implications for Staff Training and Education.....	182
Implications for Further Research.....	183
Summary .....	185
<b>LIMITATIONS OF THIS RESEARCH .....</b>	<b>187</b>
<b>CONCLUSION .....</b>	<b>188</b>
 <b>APPENDICES.....</b>	 <b>189</b>
Appendix 1: Data Collection Tool .....	189
Appendix 2: Participant Letter and Consent .....	190
Appendix 3: Ethics Approval .....	194
Appendix 4: 'NICE' Foetal Information for Families.....	196
 <b>REFERENCE LIST .....</b>	 <b>206</b>

## List of Tables

<b>Table</b>	<b>Title</b>	<b>Page</b>
Table 1.1	Indications for CEFM	29
Table 2.1	Summary Details of EBCPG regarding Foetal Monitoring	45
Table 3.1	The Participants	70
Table 3.2	Data Analysis – Categories formed during Axial Coding	75
Table 3.3	A Modified Paradigm Framework for Categories	76
Table 4.1	Consequences for Women and Consequences for Midwives	132
Table 5.1	Summary of Recommendations	176
Table 5.2	Categorising of Recommendations	177



## List of Figures

<b>Figure</b>	<b>Title</b>	<b>Page</b>
Figure 1.1	A Doppler	21
Figure 1.2	A Cardiotocograph Machine	22
Figure 1.3.	External and Internal Monitoring Devices	23
Figure 3.1	Concept Map – Labouring Women + CEFM	77
Figure 3.2	Concept Map – Bending the Rules	78
Figure 3.3	Concept Map - Theory Building	79
Figure 3.4	Concept Map: A Matter of Trust	82
Figure 3.5	Diagrammatic Representation of the Paradigm	83
Figure 3.6	Decision-Making Paradigm	85
Figure 4.1	Midwives’ Decision-Making Pathway and Factors Influencing the Use of the CTG on Low Risk Labouring Women	93
Figure 4.2	Midwives’ CEFM Decision-Making, Despite EBCPG	94
Figure 4.3	Decision-Making Process	104
Figure 4.4	Less Experienced Midwives’ Decision-Making Process - Using the CTG on Low Risk Labouring Women	113
Figure 4.5	The Effect of Trust in Others on Midwives’ Decision-Making: Using the CTG on Low Risk Labouring Women	120
Figure 4.6	More Experienced Midwives’ Decision-Making Process - Using the CTG on Low Risk Labouring Women	126
Figure 4.7	Decision-Making Pathway & Interruptions	131
Figure 5.1	Comparing Midwives’ Decision-Making Pathway and Phases of Nursing Decision according to Lauri et al.	142
Figure 5.2	Comparing Three Pathways	144
Figure 5.3	A Sample Decision-Making Pathway about Foetal Monitoring	149
Figure 5.4	Decision-Making Pathway and Factors Influencing the Foetal Monitoring on Low Risk Labouring Women	181

## List of Abbreviations & Definition of Terms

ACMI	Australian College of Midwifery Incorporated.	A national peak body for midwives, setting professional practice and educational standards.
ACOG	American College of Obstetricians and Gynaecologists	Leading authorities in the United States of America on reproductive health care, producing national clinical guidelines on important women's health issues.
CTG	Cardiotocograph	An electronic monitor with two monitoring leads. The first lead is attached to the tocodynamometer disc and is strapped to the woman's abdomen at the fundus to detect and record external tension exerted by uterine contractions. The second device may be either a disc or an electrode. The disc is strapped over the abdomen at the approximate position of the foetal shoulder to record the foetal heart beat, the electrode can be connected to the foetal head via the vagina. The readings are amplified and recorded onto the cardiotocograph paper (Olds, London & Ladewig, 2000).
CEFM	Continuous Electronic Foetal Monitoring	Continuous foetal monitoring by utilising a cardiotocograph.
EBCPG	Evidence Based Clinical Practice Guideline /s.	A statement recommending best clinical practice based on scientific literature. The statement details and grades the strength of the evidence and the process used to develop the statement. Commonly developed by professional and regulatory health bodies.
GT	Grounded Theory	An approach to collecting and analysing qualitative data and developing theory grounded in the phenomenon under study (Polit, 2006).
	High Risk Pregnancy	Any pregnancy in which pregnancy outcome may be altered by a maternal or foetal medical factor (Levy-Shiff, Lerman, Har-Even & Hod, 2002).
	Low Risk Pregnancy	Any pregnancy with no identified maternal or foetal medical condition.

IA	Intermittent Auscultation	Listening and assessing the foetal heart rate and pattern through the pregnant abdomen at regular intervals using a Pinard foetal stethoscope, stethoscope or electronic ultrasound Doppler.
NHS	NHS Centre for Reviews and Dissemination	A body providing research based information about the effects of interventions used in health and social care to the National Health Service.
NICE	National Institute for Health and Clinical Excellence	An independent body providing national guidance on health issues for the United Kingdom.
QNC	Queensland Nursing Council	Regulatory body monitoring and setting standards for nurses and midwives in Queensland.
RANZCOG	Royal Australian and New Zealand College of Obstetricians and Gynaecologists	An authoritative body on reproductive health care, producing clinical guidelines on important women's health issues for Australia and New Zealand.
RCOG	Royal College of Obstetricians and Gynaecologists	Leading authority in the United Kingdom on reproductive health care, producing national clinical guidelines on important women's health issues.
RCT	Randomised Controlled Trial/s	An experimental approach involving two groups randomly assigned to a treatment group and a standard group (Polit, 2006).
SOGC	Society of Obstetricians and Gynaecologists of Canada	Leading authority in Canada producing national clinical guidelines on important women's health issues.
WHO	World Health Organisation	The United Nations health authority promoting the highest possible level of health worldwide.

## CHAPTER ONE: INTRODUCTION

### INTRODUCTION

The midwife plays a significant role in monitoring the health and well-being of the woman and her family during their labour and birth journey. This journey is a significant life event as the woman evolves from Womanhood to Motherhood and the foetus leaves the uterus to join the family. Robust evidence supports monitoring both foetal and maternal health status during this journey to enhance birth outcomes that impact on the health of families and society as a whole. The midwife supports the woman to enhance the natural processes of labour, monitors the maternal and foetal heart rates, the uterine contraction pattern and minimises unnecessary interruptions to these processes. Continuous electronic foetal monitoring (CEFM) is one intervention that can potentially interrupt the natural processes of labour.

Using CEFM in the case of a complicated (high risk) labour and birth journey is known to improve foetal outcomes, justifying its use. For uncomplicated (low risk) journeys, however, intermittent auscultation (IA) is the recommended method to monitor the foetus during labour and birth. Using CEFM in low risk labour and birth offers no improvement in long term foetal outcomes, restricts the woman's comfort choices, interrupts natural birthing behaviours and often leads to increased medical interventions. Despite this, many midwives decide to use CEFM on women experiencing a low risk labour and birth journey.

This Grounded Theory (GT) study explored the decision-making processes of a sample of midwives who used CEFM on a low risk labouring woman and generated a

substantive theory of *Midwives' decision-making and CEFM despite evidence based guidelines*.

Selected midwives, currently employed within two hospital settings in Queensland, Australia, were recruited to the study and their clinical reasoning and underpinning beliefs were explored. Data were collected by unstructured interviews and GT methods were utilised to concurrently gather and analyse data, to discover the substantive theory that emerged from the data. Factors, including Trust, were found to have a profound effect on decision-making relating to the use of CEFM on low risk labouring women. This finding has implications on health care professionals to address mistrust issues and introduce strategies to enhance and develop interprofessional trust within the maternity setting.

This chapter describes the research problem, the reason for the study and the study aim. The local context of the study and broader background set the scene for this study by outlining the changing childbirth culture in society, professional accountability, the role of the midwife and an overview of foetal monitoring. At the end of the chapter a preview of how this thesis is organised is presented. The research problem will initially be outlined.

### **The Research Problem**

The use of CEFM on low risk labouring women is characteristic of the overmedicalisation of 'normal' birthing in today's health culture within developed countries (Johanson, Newburn & MacFarlane, 2002). A significant increase in interventions during labour and a rise in the rate of caesarean births have been associated with the wide use of CEFM, whilst the increased rate of CEFM has shown no

corresponding improvement in long term foetal outcomes (Flood Chez, Harvey & Harvey, 2000; Hoerst & Fairman, 2000). The practice of utilising CEFM to monitor the foetus in low risk labouring women is contrary to current evidence based recommendations, yet, in a climate where 70 – 80% of women are considered low risk at the commencement of labour, high numbers of women are monitored using CEFM throughout the western world (World Health Organisation [WHO], 1996). Recent statistics indicated that 53% of women in Queensland had CEFM during labour (Perinatal Statistics – Qld, 2000), 75% in Canada (Davies, Hodnett, Hannah & O'Brien-Pallas, 2002) and approximately 80% in the USA (Banta & Thacker, 2001). These statistics suggest that, despite research findings and clinical recommendations pertaining to CEFM, this method of foetal monitoring continues to be used unnecessarily on low risk labouring women.

### **Reason for the Study**

As a midwife working in a Queensland maternity setting for approximately 20 years, I had been employed as a clinical midwife at one of the two hospitals within the district in which the study was undertaken. At the time of commencing this study, I was employed as a Midwifery Educator within the district and had been involved in providing staff training on the use of CEFM. I noticed staff had varying responses to the training, despite the support of clearly articulated policy and procedural documents to outline the latest recommended practice. Some staff implemented recommended practice, however, others appeared to make very little effort to incorporate evidence based changes into their clinical practice and continued to use the cardiotocograph (CTG) on low risk labouring women. I also witnessed significant inter-professional conflicts, as midwives attempted to maintain a balance between supporting and advocating for the labouring women, whilst working collaboratively in a multidisciplinary team with team

members, such as medical officers, who did not share the same philosophical viewpoints.

I also witnessed a disparity of behaviours in labouring women during my years of midwifery practice; some women were well informed and assertively contributed to decision-making, whilst a significant number of women remained non-engaged in their health care choices. A recent report on maternity services in Queensland (Hirst, 2005) supports this observation, recognising that women engaged in maternity services within Queensland have limited informed choice and in fact, limited choice in general, in relation to pregnancy, labour and birth care. Even though policy documents from authoritative bodies, such as WHO (1996) and Queensland Health (2002), espoused that the pregnant woman be central to decision-making, at this stage, it was thought that this was more of a reporting process to the woman, rather than a partnership relationship (Taylor, 2001). Observing the different behaviours of midwives and women triggered me to research these phenomena and to explore the midwives' decision-making processes and to identify factors that influenced the use of CEFM on low risk labouring women.

In summary, CEFM continues to be used on low risk labouring women, despite education on the latest evidence based clinical practice recommendations. This phenomena has been witnessed in the local setting of two busy regional hospitals within Queensland, providing an ideal setting in which to examine the complexities of the phenomena under study, as outlined within the following study aim.

**Study Aim**

The aim of this study was to explore the decision-making processes of midwives using CEFM and to identify factors that influenced the midwives in deciding to use CEFM on low risk labouring women. In accordance with GT methods, no hypothesis was posed prior to the study. This allowed concepts and the final theory to emerge from the data, free from predetermined expectations of the researcher (Strauss & Corbin, 1998).

**Local Context**

At the time of the research there were approximately 2800 births per annum within the regional district under study (Queensland Health, 2004). In one hospital in the district, there were four birthing suites and the other, six. Both maternity units were constantly busy and at times women laboured in the maternity ward due to a lack of availability of birth suite accommodation. To add to this busy environment, junior medical officers with limited obstetric experience were part of the core staff within the multidisciplinary team. Furthermore, often any experience they had was often based in a tertiary hospital, where women were more likely to be experiencing high risk labours.

Women within this regional health service district were cared for under a multidisciplinary model of care with no single midwifery model of care being offered across the full continuum of antenatal, birthing and postnatal care. This meant that women would be seen by multiple staff members during their care with no opportunity to develop a relationship with the staff members. There was however, the opportunity for women to attend a midwives clinic in the antenatal period, but having the same midwife care for the woman during labour and birth or during the postnatal period was very unlikely. Midwives within the district were rostered for eight hour shifts, therefore,



women would be cared for by a number of midwives during their labour. For example, on average a woman is in labour for 12 hours (WHO, 1996); if a woman presents in labour at twelve midday, the day shift midwife will look after her until three o' clock when the day shift midwife hands over to an evening shift midwife and at eleven o' clock in the evening, if the woman is still in labour, her care is handed over to a third night shift midwife. This demonstrates how a number midwives may care for a woman during her labour. This is relevant to the local context, because some midwives initiate a CTG trace as part of their baseline assessment of a woman at the commencement of a shift, influencing the woman's exposure to CEFM. Other factors influencing this study will now be described in the background section of this chapter.

## **BACKGROUND**

Cultural and social factors play a major role in determining the significance of childbirth in society and societal factors impact on the labour and birthing environments for women (Ottani, 2001). This section presents some of the cultural, social and societal factors of the labour and birth environment. The significance of the labour and birth journey, the role of the midwife, the development of foetal monitoring and surrounding issues, such as evidence based practice and decision-making, will be explored to establish the background for this study.

### **The Labour and Birth Journey**

The labour and birth journey is a significant stage of the human life cycle (Hall, 2001; Ottani, 2001). This section explores contemporary birthing and highlights some of the significant changes in relation to childbirth at a societal level and its impact on reproductive health care.

Childbearing beliefs, rituals, perceptions and behaviours are different throughout the world (Ottani, 2001). Childbirth is for some, more of a physiological process and experience, for others, however, childbirth is a significant event challenging the interrelational aspects of their mind, body and spirit (Hall, 2001; Ottani). Pregnancy and motherhood may be a time when a woman seeks personal significance and a life purpose, therefore, providing an appropriate environment for care of the woman during this time is crucial (Hall, 2001). The way society cares for childbearing women reveals the philosophical priorities and cultural principles of the society (Hirst, 2005). For example, midwifery care in Malaysia and Indonesia consists of coconut belly rubs and the avoidance of any medicines during labour, portraying their cultural belief that the labour experience is an important part of becoming a mother (Kanagaratnam, 1995). In contrast, some women living in Australia choose to have an elective caesarean to avoid the 'risky business' of labour and birth, representing their view that labour is predominantly a physiological process that is safer to avoid (Saxena, 2006). Societies are continuously facing challenges that create adjustments of cultural principles and priorities about childbirth; these challenges often result in societal change and impact on the health care environment. In Australia today, childbirth is different compared to years gone by; increasing rates of caesarean birth represent a growing culture whereby women accept caesareans as an easy and convenient way to birth their baby (Walker, Turnbull & Wilkinson, 2004). Some aspects of the past Australian childbirth culture are illustrated in the following personal stories, set in Northern New South Wales and South East Queensland.

My mother was born in the 1930s in rural Northern New South Wales and moved to South East Queensland in her forties. She has seen, heard and experienced many

changes in the childbirth culture during her lifetime that have impacted on the health care offered to herself, her family members and friends. During her childhood, my mother was told stories of her grandmother, a lay midwife, riding on horseback to be with and support local women during childbirth in their homes. These stories contrasted significantly to her birth stories from the 1950s and 60s in a small northern New South Wales hospital. Over a number of years, my mother gave birth to six children during a time when it was accepted practice to anaesthetise the woman with Ether for the birth. My mother recalls enduring the pain of labour and then missing out on the birth of each of her babies because a cloth was placed over her face just when the baby was about to be born. She recalls waking up to be presented with a neatly wrapped new baby that ‘you didn’t dare unwrap!’ My mother was not allowed to have anyone to support her during labour, so my father was not allowed in the labour ward. Childbirth during these times was often remembered as lonely, cold and terrifying (Allen, 2002).

In contrast, in the 1980s, when I birthed my first baby, my husband accompanied and supported me during labour and birth at the hospital. He was, however, required to attend a birth movie and request consent from the Director of Nursing to be allowed in the hospital labour ward, where he was required to wear a surgical gown. Some of my care during labour was discussed with me and I made some choices about my care during labour and birth. My mother viewed my daughter through a window, as visitors were not allowed any contact with the newborns.

By the time I birthed my son in the 1990s, I was more informed of my choices and made a choice to spend most of my labour in the shower. (Something that would certainly not have been acceptable in my mother’s day!). There was no need for the consent or the gown for my husband and he helped birth my son alongside the

obstetrician, whilst the midwife offered me individualised support. I recall this birth as confirming of my womanhood, more so than my first birth, when I was less involved in birth care choices. Even though aspects of these labours and births were all different, each birthing event is remembered as a major milestone in the social life of our family and celebrated as a special family event.

These stories represent some of the major changes in childbirth during the 20<sup>th</sup> Century in Australia. These changes include the movement of childbirth from the home environment, supported by lay midwives, to the hospital environment, where pregnancy and birth care was predominantly controlled by medical officers, with a gradual resurgence of midwifery care evolving within the hospital settings and the introduction of informed patient choice. Changes in women's involvement in their care and informed decision-making are evident in these stories. My mother was offered no choice about her care, whereas I birthed during a period of increasingly informed choice. A change can also be noted with the notion of an evolving partnership model in labour and birth care. In the 1990s my husband was invited to be involved in the birth of his son, with support of an obstetrician. This is of great contrast to the experience of my father in the 1960s, who was not even allowed in the labour room. Changes such as these have been scrutinised over the years in the midwifery literature.

Literature has highlighted the change to a more medicalised culture surrounding pregnancy and birth by publishing research demonstrating improvements in physiological outcomes as a result of women having better access to skilled health professionals and emergency assistance when birthing in a hospital (Schramm, Barnes & Bakewell, 1987). However, the psychological and social impacts of the medicalisation of normal birth have not been considered with the same degree of rigour

(Hirst, 2005). Today, however, the natural childbirth movement has raised awareness of such issues and this has resulted in questioning the medicalisation of birth in today's society (Taylor, 2001).

Research indicating positive outcomes relating to patient safety and satisfaction in midwifery care are fuelling consumer demands that are reforming Australian Government policy (Brodie & Barclay, 2001). Government policy, governance by regulatory bodies such as the Queensland Nursing Council (QNC) and professional organisations such as the Australian College of Midwifery Incorporated (ACMI), now support the notion of women having a shared partnership with their health professional, informed consent and recognise the celebration of birth events as part of the individual's social culture (ACMI, 2001; QNC, 2005).

In 2004, a review was established to examine pregnancy, birth and postnatal care in Queensland (Hirst, 2005). Two distinct cultures were discovered through this review. One cultural group espouses pregnancy and birth as a normal part of the human life cycle, seeing it as predominantly a natural process requiring medical intervention only as needed. The other group place pregnancy and birth as a potentially high risk event that is best handled with dedicated care by expert health professionals with emergency resources on hand at all times.

In general, it was reported that most Queensland women did not meet their labour care provider until labour and were found to have few choices surrounding labour and birth care with a lack of informed choice (Hirst, 2005). Consequently, there is still a potential for birth experiences to be remembered as terrifying by Queensland women today. The

Re-Birthing report (Hirst) recognises that maternity care in Queensland must change to meet the needs of women and families birthing in Queensland in the 21<sup>st</sup> Century.

Significant issues are raised in the Re-Birthing Report about maternity services within Queensland (Hirst, 2005). Pregnancy and birth care remains mostly streamlined within hospitals, which impacts on the philosophical milieu of birthing, with pregnancy and birth being associated with illness and risk, potentially impacting also on the use of CEFM during labour. Even though Queensland midwives are mandated by the Queensland Nursing Council to work autonomously, many obstacles continue to block autonomous midwifery practice (Hirst).

The Re-Birthing Report supports the introduction of midwifery models of care as mainstream services for low risk women and further suggests that care be predominantly provided within community settings rather than hospitals. This report adds strength for significant changes to occur in Queensland maternity services and supports further autonomy of the midwife. It also adds significance to this study. Examining the extent of midwifery autonomy in relation to decision-making within this changing health care environment will potentially add new knowledge on midwives' behaviours and perceptions. This information may assist policy makers and change agents in their quest to reform maternity services in Queensland including supporting autonomous midwifery practice.

### **The Role of the Midwife**

The midwifery role in Australia has undergone significant change over the years. To demonstrate this I would like to again reflect on the stories shared earlier about birth experiences, but this time focus on the changing role of the midwife.

The story of my great-grandmother riding on horseback to ‘be with’ and support local women during childbirth in their homes during the early 1900s, reflects the autonomous midwifery role prior to the medicalisation of childbirth. This midwifery relationship *with woman*, has been described as delivering a message of value or worth from one woman to another, thereby empowering the labouring woman (Guilliland & Pairman, 1995). However, by the 1950s, this *with woman* midwifery role moved rapidly from supporting a natural birthing process to one of a technical and treatment role (Lewis & Rowe, 2004a). By this time, my mother was ‘attended to’ during labour by midwives who assisted the medical officers by administering the Ether, whilst the medical officer delivered the baby. This is a stark comparison to being *with woman*. The midwifery role became regulated by protocols and rules, including listening to the foetal heart every five minutes once the woman was in strong labour (Lewis & Rowe). Even into the 1980s this regimented foetal monitoring practice continued, however, by this time CEFM had become part of the foetal monitoring protocol as midwifery adopted a scientific focus (Lewis & Rowe). By the 1990s the midwifery role encompassed quality assurance, which gave rise to a gradual resurgence of midwifery focused care, however, risk management was also a key focus. An emphasis on risk management meant that even though labouring women were offered choices, they were carefully balanced with the midwife’s perspective of risk (Lewis & Rowe).

Some significant changes within the midwifery role over recent decades associated with the medicalisation of pregnancy and birth have included a shift of the midwifery role from being *with woman* during natural births in the home setting to obstetric assistant within the hospital setting, (Hyde & Roche-Reid, 2004). Today, the midwifery role has a technical focus within a culture of risk management, yet there is recognition of the

importance and benefits of being *with woman* and a resurgence of *woman centred* care (Page, 2000).

The role of the midwife in Queensland as discussed within the recent Re-Birthing report on maternity services within Queensland (Hirst, 2005), recognised that Queensland maternity services have evolved over a long period of time with no evidence of maternity services being planned within a strategic framework to guide the way forward in a systematic manner, or of any involvement of key stakeholders, including women (Hirst). Midwives have been part of this evolving process, which has led to a blurring of roles between medical officers and midwives and unclear professional boundaries (Foley & Faircloth, 2003).

In 1999 – 2000, the Queensland Nursing Council responded to this lack of clarity by collaboratively developing the ‘Code of Practice for Midwives’ (QNC, 2000; QNC, 2005), which outlines the role and responsibilities of the midwife. The responsibilities of the midwife include providing advice, support and care for women in the preconception period, during pregnancy, labour and birth and during the postnatal period (QNC). According to this Code of Practice, the midwife is expected to promote and enhance the normal processes of labour and birth, whilst being flexible and to recognise and refer when the health of the woman or infant deviates from normal. Midwifery practice is deemed a partnership with women to provide care in an open and honest environment, in a *woman-centred* manner, with respect for the woman’s individuality and personal choices. This role encompasses supporting the woman to make an informed choice and to support and advocate for the woman’s choice about her health care (QNC). Current evidence based guidelines clearly recommend that the decisions regarding health care, including foetal monitoring in labour, should be



reached jointly between the informed pregnant woman and the care provider (Thacker, Stroup & Chang, 2003). Regulatory bodies and Government policy support the resurgence of autonomous midwifery practice and the notion of being *with woman* through documents such as the Code of Practice for Midwives and the Queensland Health report in response to Re-Birthing (Queensland Health, 2005).

The principle of advocacy within the role of the midwife is also identified clearly within the internationally accepted definition of a midwife (WHO, 1996) and the Midwifery Scope of Practice (ACMI, 2001; QNC, 2005). This advocacy role also links with the essence of being *with woman* and sharing the woman's birthing experience. This relationship within the role of midwifery is one that is difficult to measure, but is the basis of many women's birth stories.

These principles of advocacy and empowerment are not always practiced, as midwives are frequently confronted with having to choose between their duty to follow institutional routines and protocols and their obligation to serve in the role of advocate or moral agent for their patients (Wood, 2003). The Royal College of Obstetricians and Gynaecology (RCOG), a peak body in the United Kingdom overseeing standards of women's healthcare also support advocacy for women. RCOG states that birth suite clinicians must include information regarding the efficacy of CEFM to ensure women are informed of CEFM issues and risks (ROCG, 2001).

Even though these documents (ACMI, 2001; QNC, 2005; WHO, 1996) support the midwifery role in its essence of being *with woman*, reports and research from clinical practice areas suggest this role is not always being practiced in relation to the use of CEFM on low risk women. Evidence that the rates of CEFM on low risk labouring

women range from 53% - 80% (Banta & Thacker, 2001; Davies et al., 2002; Perinatal Statistics – Qld, 2000) suggest that the midwifery role is being influenced by factors other than advocacy and being *with woman*. This further supports the need for this study to explore midwives' decision-making in relation to foetal monitoring on low risk labouring women. One factor to be further explored is midwives' accountability for clinical practice and decision-making.

### **Accountability and Regulation of Clinical Practice**

The provision of health care is philosophically centred on quality and best clinical practice (NHS Centre For Reviews & Dissemination [NHS], 1999). With the increased activity in health research in recent decades the health sector has an improved availability of research based findings and clinical practice guidelines on which to base health policy. This has resulted in an evidence based practice movement within the health care sector (NHS). Evidence based practice can be defined as the integration of the most current, relevant, scientifically based information and the clinical judgement of the clinician, applied to the context of any given situation (DeBourgh, 2001). As research on health care and health outcomes has increased, a variety of clinical practices have been challenged regarding whether they are scientifically based and supported by current research, one such challenge has been using CEFM on low-risk labouring women. The publication of health research has also meant that consumers have a greater awareness of health matters with a higher level of accountability for health care institutions and professionals evolving as a result medico-legal issues and litigation (Kripke, 1999).

Discussions of medico-legal issues and litigation are reflected in a climate of increasing litigation claims, particularly in the obstetric sector with consumers apportioning blame and being financially compensated for unexpected outcomes (MacLennan, 2001; Mahlmeister, 2000; McRae, 1993; Perlman, 1997). Consumers are more likely to question health care processes and health care professionals when adverse events occur. Litigation proceedings have been undertaken and patients have been awarded compensation from health care professionals and health institutions, such as hospitals (Kripke, 1999). As a litigious culture adds to overcautious behaviours of clinicians, clinicians feel safer by using CEFM in an attempt to reduce the risk of malpractice cases (Kripke). This litigious culture also adds to the complexity of professional roles and decision-making on the use of CEFM and justifies the need for this study.

The litigious culture and expectation of increased accountability of health institutions and professionals have also impacted on the development of duty of care regulations. Policies clearly articulate the duty of care of health institutions and their obligations to patients to provide quality and best practice standards in health care (NHS, 1999). Health institutions also have a duty of care to employees to provide a safe work environment, including orientation and ongoing training on health care policy to their employees (Queensland Government, 1995). Employees have a duty of care to their patients at a professional level to base their clinical practice on latest evidence based clinical practice guidelines (EBCPG) as well as a duty of care to their employee to follow policy and as part of their employment contract (Queensland Health, 2006).

One strategy that has been implemented in an attempt to ensure that both employees and employers meet the complexity of duty of care requirements in regard to the implementation EBCPG into clinical practice, has been the development of local policy

and procedure documents. These local policy and procedure documents give direction to staff during clinical practice and provide documented evidence that the health institution is promoting evidence based clinical practice as part of meeting their duty of care. Overseeing the development and regular updates of policy and procedure, according to latest research findings, has become a major role of health managers today (Williams, 2006). Staff are mandated to ensure clinical practice is evidence based as part of their duty statement and also by the regulatory authorities, such as Nursing and Midwifery registration boards, for example, The Queensland Nursing Council (QNC, 2005) and by professional bodies, such as the ACMI (2005).

Changes in policy and procedure, however, remain dependent on health professionals implementing the change into clinical practice. Some changes in policy mean that health professionals are required to change long-held patterns of behaviours (NHS, 1999). Consequently, achieving this change in practice has been found to be difficult and complex (NHS). This has been the case regarding the implementation of EBCPG on foetal monitoring where policy recommendations clearly state that intermittent auscultation (IA) is recommended for low risk labouring women, yet, many low risk labouring women continue to be monitored with CEFM. The reasons for this are not clear and will be explored in this study.

### **Decision-Making and Foetal Monitoring in Labour**

Traditionally the medical profession has directed decision-making within health care settings. Nurses and midwives have been subordinate to medical officers and required to follow medical officer's orders according to the chain of command within the workplace (Taylor, 2001). Recently, a medico legal case challenged the 'chain of command' between the obstetric medical officer and the nurse / midwife resulting in

blame being apportioned to the midwife, not the obstetric medical officer (Mahlmeister, 2000). This outcome demonstrated that not only can blame be placed on obstetric medical officers but also on obstetric nurses and midwives for accountability of their actions when caring for a woman with CEFM. This case demonstrates that obstetric nurses and midwives are no longer exempt from litigation and that they must take accountability of their own decision-making and highlights the importance of midwives working according to their scope of professional practice.

Patients too have been expected to comply with a medical officer's orders (McCallin, 2001). Most patients would not question the medical officer or midwife's actions, relying on the integrity of the health professionals to do what is best for them (Wood, 2003). Therefore when a medical officer ordered CEFM or expected that a CTG be applied, the woman would not question the action and the midwife would apply the CTG on the low risk woman without questioning the medical officer. According to the midwifery scope of practice (QNC, 2005), however, the midwife has the decision-making scope pertaining to the pregnancy, birth and postnatal care for low-risk women (Brodie & Barclay, 2001). In this scenario, therefore, the midwife has a professional duty to ensure evidence based care is provided to this woman, regardless of the medical officer's orders (QNC, 2005). This midwife should therefore question the medical officer's request.

Determining the degree of risk is an important part of the midwives' clinical assessment of the woman. When the woman is classified as being low risk then the midwife has the autonomy to decide on the most appropriate care and form of foetal monitoring for the woman. If the woman is classified as high risk the midwife is required to work in close consultation with the medical officer to make care decisions, with the medical officer

being the main decision-maker (ACMI, 2004). To further support the autonomous midwifery role when caring for low risk women, the Australian College of Midwives Incorporated (ACMI, 2004) developed professional guidelines detailing clear referral criteria to guide midwives' referral to a medical officer when a woman's condition alters from the low risk criteria.

Decision-making by clients has also been promoted. Informed consent guidelines have been fully supported by the Queensland Government with documents available to all patients to inform them of their right to make decisions about their health care and informed consent processes (Queensland Health, 2002). Risks and benefits associated with the intervention and any alternative intervention or choices are to be fully explained to the client according to the guidelines. Brochures about specific topics have also been published to help inform women about certain procedures such as foetal monitoring (National Institute for Health & Clinical Excellence [NICE], 2001). It is the responsibility of medical officers and midwives to ensure that interventions during health care are preceded by clear explanation to the woman regarding any intervention such as CEFM, thus ensuring informed consent. Information specific to foetal monitoring is broadly available to health professionals to help facilitate the informed consent process. Some of this information will now be outlined in the following section on foetal monitoring.

### **Foetal Monitoring**

#### **Rationale**

Foetal monitoring denotes the assessment of the state of health of the foetus. Monitoring the health of the foetus during pregnancy, labour and birth is a fundamental role of the

midwife and medical officer (Olds, London & Ladewig, 2000). Throughout labour there is an increased foetal oxygen demand related to the increased activity of the uterus and foetus. Foetal health may be threatened if this additional oxygen is unavailable or unable to be delivered to the foetus during labour (Olds et al.). A variety of factors may contribute to insufficient foetal oxygenation, commonly, cord compression and utero-placental insufficiency. Foetal hypoxia is commonly signified by a change in the foetal heart rate, therefore it is recommended that the foetal heart rate be monitored frequently during labour (Olds et al.).

### **Methods of Foetal Monitoring**

The health professional has a choice of different methods to monitor the foetus, including a Pinard foetal stethoscope, a stethoscope, a Doppler or the cardiotocograph (Olds et al., 2000). The foetal heart rate can be monitored intermittently by intermittent auscultation (IA) or continuously during labour by using a CTG machine (CEFM).

A Pinard foetal stethoscope, stethoscope or Doppler may be used to intermittently monitor the foetal heart rate. A Pinard foetal stethoscope is a hand held cone shaped apparatus that is placed between the pregnant woman's abdomen and the health professional's ear (Olds et al., 2000). The health professional palpates the abdomen to identify the foetal lie and then places the Pinard foetal stethoscope over the foetal back or chest and counts the foetal heart rate, listening for any rhythm irregularity. A stethoscope can also be used to auscultate the foetal heart sounds in the same way as the Pinard foetal stethoscope (Olds et al.).

An electronic Doppler is a hand held ultrasound device that transmits foetal heart sounds through a speaker or into earpieces, when the transducer is placed over the

abdomen approximate to the foetal heart (Olds et al., 2000). The health professional listens to the rate and rhythm of the foetal heart rate. Figure 1.1 illustrates one type of Doppler (Figure 1.1).

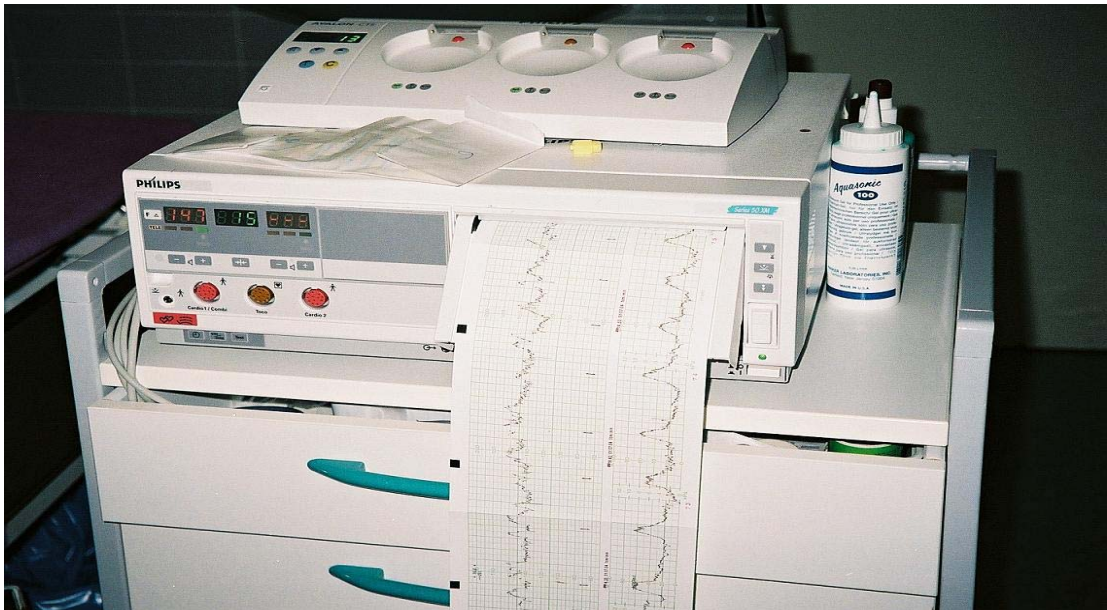
**Figure 1.1: A Doppler**



**SOURCE:** Tummy Ticks Accessed from: [http://www.tummytickles.com/pregnancy\\_doppler.html](http://www.tummytickles.com/pregnancy_doppler.html)

The cardiotocograph (CTG) is a device that can be used to monitor the foetal heart rate continuously by an ultrasonic transducer (CEFM), while a tocodynamometer records the uterine contraction pattern (Olds et al., 2000). These measurements are recorded on a moving strip of paper to form a continuous record of the heart rate and contraction pattern. Figure 1.2 illustrates a cardiotocograph machine and the paper printout. The waveforms on the left side of the paper indicate the foetal heart rate pattern and the on the right of the paper, the contraction pattern can be seen.



**Figure 1.2: The Cardiotocograph**

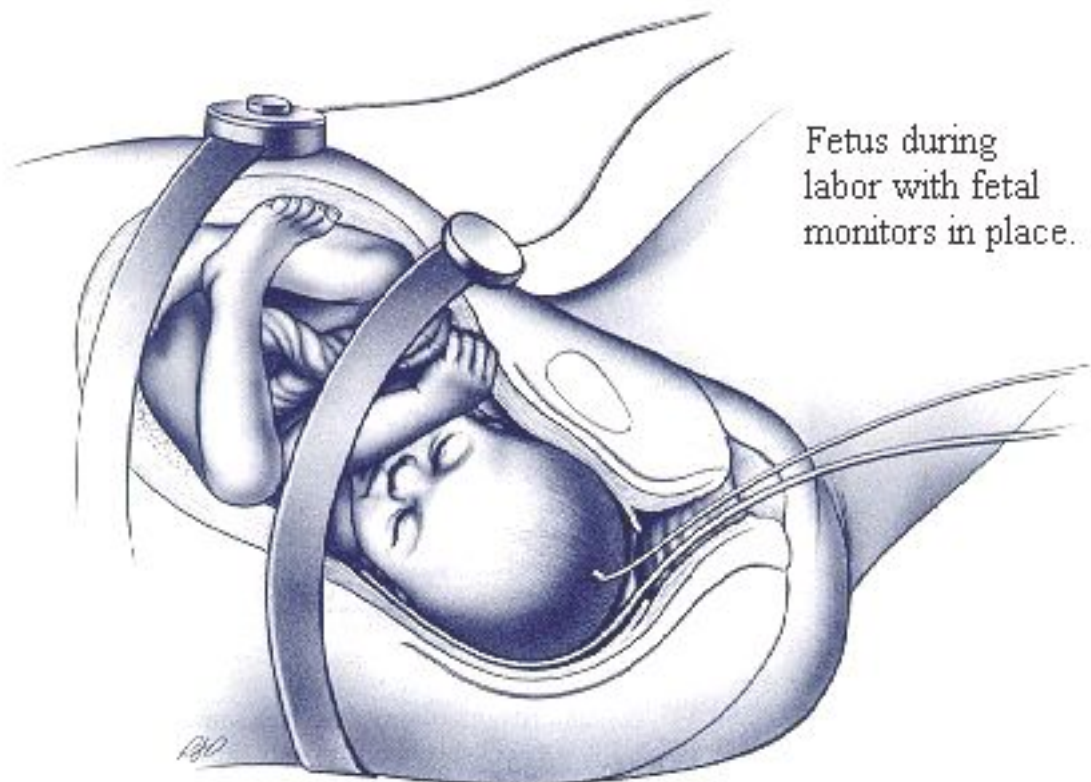
**Source:** Wikimedia Commons accessed  
from: <http://upload.wikimedia.org/wikipedia/commons/a/a7/Kardiotokograf.jpeg>

Electronic monitoring devices may be external or internal (Olds et al., 2000). These types of devices can be seen in Figure 1.3. The two straps and transducers around the abdomen provide external monitoring of the foetal heart rate and contraction pattern. The devices shown within the uterus are used for internal monitoring. The woman may have external monitoring only (two straps around the abdomen), internal monitoring only (two internal devices) or the external device to monitor contractions and an internal device to monitor the foetal heart rate (one abdominal strap and one internal device which is secured by an anchor strap around the woman's upper thigh). All four devices would not be used at the one time.

Internal monitoring of the foetal heart rate involves the insertion of a small electrode into the foetal scalp during a vaginal examination, if the cervix is sufficiently dilated to access the foetal scalp (Olds et al., 2000). Internal monitoring devices may be used

when a more accurate recording is required, for example, presence of signs of foetal distress (Olds et al., 2000). The internal monitoring device that detects the strength of uterine contractions can also be inserted into the uterus via the vagina, but is rarely used in Queensland.

**Figure 1.3. External and Internal Monitoring Devices**



**Source:** [www.doctoronline.nhs.uk](http://www.doctoronline.nhs.uk)

CEFM can also be connected to a telemetry system whereby the woman wears a small battery operated transducer in a shoulder bag (Olds et al., 2000). The signals are transmitted to a remote monitor at the staff workstation where the CTG print out is monitored.

A further method of foetal monitoring during labour that is used when the CTG trace is non-reassuring is foetal blood sampling (Olds et al., 2000). Any health facility equipped

with equipment for CEFM is also recommended to have foetal blood sampling facilities available (ROCG, 2001). A foetal scalp blood sample is obtained by a medical officer from the foetal scalp by inserting a conical speculum through the vagina to access a clear view and working area on the foetal scalp. When this is achieved the scalp is punctured to collect the blood sample. The sample is then examined for pH and lactate levels, which reflect foetal health. Combining a concerning CTG with foetal blood sampling increases the reliability of diagnosing foetal compromise (Olds et al.).

In summary, a variety of methods ranging from simple, non-invasive methods to complex tests are currently available to monitor the foetus during labour; these options of foetal monitoring have not always been available however. The historical development of foetal monitoring will now be outlined.

### **Historical Perspectives**

A review of the historical development of foetal monitoring contextualises the CTG and the use of CEFM in today's health care culture. Early in the 19<sup>th</sup> Century, it was discovered that the foetal heart could be heard by placing the ear to the pregnant abdomen (Wickham, 2003). The stethoscope was engaged to improve auscultation and it was found that alterations in foetal well-being could be detected in changing patterns of the foetal heart rate (Wickham). The specialised Pinard foetal stethoscope emerged in 1876 and, from then until the 1950s, techniques of monitoring by way of intermittent auscultation (IA) remained relatively unchanged (Wickham). IA, the traditional method used to auscultate the heart rate, teamed with assessing the uterine contraction pattern by palpating the woman's abdomen for a period, is a very tactile approach used to gather assessment data. The history obtained from the woman about foetal movements is also considered paramount to the clinical assessment. This traditional assessment process is

a *woman centred* approach, potentially empowering the woman through consultation and involvement (Wickham).

During the 1950s, a progression of technology resulted in the introduction of the cardiotocograph (CTG), which delivered an electronic print out of both the foetal heart rate and uterine contraction pattern (Wickham, 2003). The print out produced by the CTG was seen as superior in reflecting and proving foetal well-being compared to the traditional method of monitoring. A focus on the print out and CTG machine was noted however, to somewhat reduce the importance of the woman's involvement in the foetal assessment process (Wickham). The hope of reducing neonatal morbidity and mortality meant that the CTG was implemented to the clinical practice setting prior to thorough scientific evaluation (Lewis & Rowe, 2004a; RCOG, 2001). The first controlled study on the effects of CEFM was not undertaken until 1973 – 1975 (Kennedy, 1998). It was anticipated that the introduction of CEFM would reduce the rate of neonatal brain injury secondary to perinatal asphyxia, specifically cerebral palsy. Unfortunately, there has not been any change in long-term neurological outcomes (MacLennan, 2001) and the rates of cerebral palsy have remained constant since the implementation of CEFM (Perlman, 1997).

As the use of the CTG machine increased, so too did concerns regarding the efficacy and accuracy of CEFM. Concerns were raised about the increased rates of medical interventions during labour, with no obvious improvement to neonatal long-term neurological outcomes (Perlman, 1997). Questions were also raised about the skill of the health professionals analysing the CTG traces with discrepancies existing even between professional experts and the interpretation of the CTG trace (Blix, Sviggum, Koss & Oian, 2003). These issues highlighted complexities in the use of CEFM. As a

consequence, research recommendations evolved stating that 'high risk' women benefit from monitoring with CEFM in labour (ROCG, 2001); however, for low risk women, the preferred method of monitoring is the 'traditional' IA method (Goddard, 2001). More recently the use of foetal blood sampling in combination with CEFM has improved the accuracy of determining foetal distress in labour. Current evidence based guidelines recommend that foetal scalp blood sampling be combined with CEFM when CEFM suggests the foetus is compromised in some way during labour (ROCG, 2001).

After the launch of the CTG machine, the electronic doppler was introduced into practice in the 1960s (RCOG, 2001). The electronic doppler, a compact, portable ultrasound transducer with no facility to print data, readily detects the foetal heart sounds when placed against the woman's abdomen and can be used instead of a stethoscope or Pinard foetal stethoscope. The doppler facilitates ease of IA when the labouring woman is in a variety of positions and waterproof dopplers facilitate IA during water immersion in labour. Today, dopplers are commonly used to auscultate the foetal heart sounds intermittently during labour, although some midwives continue to use a Pinard foetal stethoscope or a stethoscope to perform IA. Commonly however, obstetricians, midwives, women and their families focus on the use of CTG technology (Hoerst & Fairman, 2000; Lewis & Rowe, 2004a). The impact on labour of different methods of foetal monitoring will now be outlined.

### **Impact of foetal monitoring methods on labour and birth**

The labour and birth experience is different for each woman (WHO, 1996). During labour the woman experiences varying degrees of discomfort or pain that the woman responds to by adopting various behaviours and activities, such as rocking, walking, immersing herself in water for comfort. The midwife offers support and encouragement

as the woman journeys through her labour and also monitors the health of the woman and foetus. The method which is chosen to monitor the foetal heart rate during labour, impacts on the woman's activity level and comfort choices.

If the midwife uses a Pinard foetal stethoscope, stethoscope or Doppler to intermittently auscultate the foetal heart sounds, there is minimal interruption to the woman's birthing behaviours and comfort measures. Whether the woman is showering, bathing or mobilising, the midwife can access the woman's abdomen every 15 – 30 minutes during established labour to listen to the foetal heart sounds. Conversely, if a CTG is used to continuously monitor the foetal heart rate during labour, the woman will be unable to have the full choice of comfort measures and will suffer limitations of mobility (Supplee & Vezeau, 1996). The belts strapped around the abdomen to hold the monitoring devices in place restrict movement and necessitate that the birthing woman stay within close proximity of the CTG machine. Many women are requested to stay supine to ensure the CTG transducer receives adequate reception of the foetal heart sound waves to create the CEFM print out. Telemetry CTG monitors enable women to have increased mobility if available (Olds et al., 2000). Telemetry CTGs were unavailable in the regional hospitals in which this study was undertaken.

Tactile comfort measures such as massage are interrupted by the CTG devices and women are unable to shower or bath (Hoerst & Fairman, 2000). Internal foetal monitoring devices require a vaginal examination and inserting the foetal monitor into the foetal scalp. The foetal monitor is then strapped to the woman's upper thigh rather than her abdomen. Often the CTG becomes a focal point rather than the labouring woman and partners, support people and caregivers have a tendency to focus their attention on the CTG instead of the labouring woman (WHO, 1996).

**Choice of foetal monitoring method**

Evidence based clinical practice guidelines (EBCPG) offer a guide to the midwife or medical officer in determining the most suitable method to monitor each foetus during labour. EBCPG recommend that the monitoring method be chosen to correspond with the level of clinical risk associated with each woman's pregnancy according to the medical and pregnancy history. Indicators are also outlined to guide the health professional during the intrapartum period. If complications occur during the course of labour, such as bleeding or conditions exist such as a post-term pregnancy, then CEFM is indicated to monitor the foetus.

The Royal College of Obstetricians and Gynaecologists (2001) developed EBCPG to guide clinical practice and policy direction on intrapartum foetal surveillance. An excerpt from this evidence based clinical practice guideline is presented in Table 1.1. The table outlines the risk factors that increase the potential of foetal hypoxia occurring during labour and therefore are indicators to use CEFM during labour. For example, a woman diagnosed with Diabetes or Hypertension in the antenatal phase of pregnancy is deemed as high clinical risk, because it has been proven by research that these conditions increase the woman's risk of complications during pregnancy and labour that may threaten the health of the woman or foetus (Olds et al, 2000). Therefore CEFM is deemed to be beneficial in monitoring the foetus for these women with risk factors. On the other hand, if the woman has no identified antenatal indicators (low risk), IA is recommended to monitor the foetal health during labour. If conditions arise during labour, such as meconium staining of the amniotic fluid, CEFM is indicated to monitor the foetus. If no intrapartum indicators are present, then IA is the preferred method to monitor the foetus.

**Table 1.1: Indications for CEFM**

<i>Phase of Pregnancy</i>	<i>Maternal Indicators</i>	<i>Foetal Indicators</i>
<u>Antenatal Indicators</u>	<ul style="list-style-type: none"> <li>▪ Hypertension</li> <li>▪ Diabetes</li> <li>▪ Antepartum haemorrhage</li> <li>▪ Other maternal medical disease, for example: renal disease, cardiac disease</li> </ul>	<ul style="list-style-type: none"> <li>▪ Small foetus – growth restriction</li> <li>▪ Prematurity</li> <li>▪ Oligohydramnios</li> <li>▪ Abnormal umbilical artery Doppler velocimetry</li> <li>▪ Isoimmunisation</li> <li>▪ Multiple pregnancy</li> <li>▪ Breech presentation</li> </ul>
<u>Intrapartum Indicators</u>	<ul style="list-style-type: none"> <li>▪ Vaginal bleeding</li> <li>▪ Intrauterine infection</li> <li>▪ Epidural analgesia</li> <li>▪ Previous caesarean</li> <li>▪ Prolonged rupture of membranes</li> <li>▪ Induction / augmentation of labour</li> <li>▪ Hypertonic uterus</li> </ul>	<ul style="list-style-type: none"> <li>▪ Meconium staining of the amniotic fluid</li> <li>▪ Suspicious foetal heart rate on auscultation</li> <li>▪ Post-term pregnancy</li> </ul>

Source: RCOG, 2001

In summary, for the labouring woman with low risk, foetal monitoring by IA is recommended while women classified as having high risk, according to EBCPG, are recommended to have CEFM during labour. When CEFM is used, foetal blood sampling equipment should be available in the event of a concerning CTG trace in labour (ROCG, 2001).

### **Background Summary**

In summary, *woman centred* care has gained strength in today's health care environment and is supported by current recommendations that reinforce the importance of informed choice for women and the advocacy role of midwives when considering CEFM. The complexity of the midwifery role today involves maintaining professional recognition, supporting clients through advocacy as well as working autonomously, yet collaboratively within a multidisciplinary team. Within this role, the midwife has clear autonomy and accountability to select the method of foetal monitoring for low risk



labouring women. However, high rates of low risk labouring women are unnecessarily monitored with CEFM. This study sets out to identify the factors influencing this phenomenon by exploring the decision-making processes of midwives using CEFM on low risk women. Understanding factors that influence this decision-making will enable policy makers and change agents to address barriers and introduce strategies that will support evidence based decision-making in the maternity setting.

## **ORGANISATION OF THE THESIS**

This thesis is presented within five chapters. This chapter has presented an overview of the study aim and objectives and introduced the local context and background of the study. Chapter Two presents a review of the literature, critiquing and summarising the known information about CEFM and its use on low risk labouring women. Literature on decision-making is also reviewed. The literature review provides justification for the study by identifying a gap in knowledge of midwives' decision-making processes in relation to the use of CEFM on low risk labouring women. The third chapter describes the research design, providing an explanation of the underpinning methodology and an indepth description of the GT approach (Strauss & Corbin, 1998) applied to the study methods. Chapter Four presents the results of the study within a paradigm framework (Strauss & Corbin, 1998), to explain the substantive theory of *Midwives' decision-making and CEFM despite evidence based guidelines* that was generated from the data. Chapter Five discusses the study findings in relation to other current research and literature and positions the findings to present recommendations with implications for maternity services, training and education and future research.

**CONCLUSION**

This chapter presented an overview of the local contextual and broader background issues, including anecdotal stories regarding the progression of changes in the midwife's role in foetal monitoring. Birth was identified as a significant life event, with the midwifery role highlighted as one offering support and advocacy for women. Despite this, CEFM continues to be utilised on low risk labouring women, thereby increasing the risk of medical interventions in labour, without the benefit of improved foetal outcomes. Since the introduction of the CTG machine, controversies about the technology have arisen and continue today. The following chapter will review the literature on the study topic and further support the need for this study to explore midwives' decision-making in relation to the use of CEFM on low risk labouring women.

---

**CHAPTER TWO: LITERATURE REVIEW****INTRODUCTION**

This chapter presents the literature review that took place during 2003 and the early months of 2004, prior to the commencement of this GT study. This chapter evaluates existing literature on CEFM and decision-making to confirm the lack of research on this topic and justify the need for the study. Some of the topics discussed within the literature since the introduction of the CTG machine have been outlined as contextual issues within Chapter One. These include the medicalisation of childbirth and the increased rate of medical intervention associated with CEFM (Hindley, 2001; Johanson et al., 2002; Parer & King, 2000); accountability for clinical practice and rising rates of litigation relating to CEFM (Mahlmeister, 2000; McRae, 1993); the development of evidence based clinical practice guidelines (EBCPG) particularly about CEFM (ROCG, 2001; Society of Obstetricians & Gynaecologists of Canada [SOGC], 2002); and the emergence of *woman centred* care and informed choice (Gilliland & Pairman, 1995; Wickham, 2003; Wood, 2003) in relation to the use of foetal monitoring. Today, if a birth suite clinician chooses to search the literature on foetal monitoring, they are faced with the task of deciphering this broad variety of topics linked to foetal monitoring to find the evidence to direct them in their decision of whether or not to utilise CEFM on a woman in labour.

This preliminary literature review examined the literature relating to the aim of the research, which was:

*To explore decision-making processes of midwives in deciding to use CEFM on low risk labouring women.*

This broad aim was used to drive the literature review, as the research question had not yet become specifically defined. When using GT, the research question becomes refined as the research progresses (Strauss & Corbin, 1998). This is contrary to other research approaches in which a defined question is formulated prior to a comprehensive literature review and the commencement of the research (Strauss & Corbin). When using a GT approach, Strauss and Corbin advise cautious use of the literature so that the researcher remains objective when undertaking the research, using literature to enhance rather than constrain theory development. Broad concepts from the literature are recommended to raise the sensitivity of the researcher, however, the researcher should avoid developing an indepth familiarity with the literature, as familiarity can influence the researcher and block creativity (Strauss & Corbin).

The broad concepts that emerged from the literature review included the rationale and methods available for foetal monitoring during labour, efficacy of foetal monitoring and controversies surrounding the use of CEFM. Evidence based clinical practice guidelines (EBCPG) and barriers to their implementation were identified as other broad concepts. A small number of studies were also found on midwifery decision-making. None were specific to the use of CEFM on low risk labouring women, confirming that other researchers had not previously addressed this topic.

Along with the researcher's professional background knowledge and experiences, the concepts identified from this preliminary literature review acted as a 'stepping off' point from which this GT study was undertaken. Consistent with GT methods, once data collection and analysis commenced, further reflection of the literature was avoided to ensure that the researcher remained focused on the data, rather than looking for a predetermined outcome (Strauss & Corbin, 1998). This is a technique recommended to

maintain maximum rigour. Following theory development, literature was revisited and reviewed in relation to the study findings, as presented within Chapter Five (Strauss & Corbin). A variety of search strategies were used to ensure a rigorous review of the literature. These strategies will now be outlined.

### **Literature Search Strategies**

Medical and midwifery texts and reputable medical, midwifery and nursing journals were explored to identify all published literature relevant to the aim of the research. Two broad topics were searched in the literature directly related to the research aim, foetal monitoring and midwives' decision-making. Varied search terms were used, such as: foetal monitoring; electronic foetal monitoring; cardiotocograph; foetal heart rate; decision-making; clinical decision-making; clinical decision-making and midwives; as well as evidence based practice. Library searches were performed as well as searches on electronic data bases, such as: The Cochrane Library, DARE, Medline (OVID version), CINAHL, MIDRS, Informit, PsycINFO, Blackwell Science and the National Guideline Clearinghouse. Professional web sites, such as 'The Royal Obstetrics College of Obstetrics and Gynaecology', were also accessed and searched for clinical practice guidelines. The findings of the literature review will now be outlined and discussed using two broad themes, foetal monitoring and clinical decision-making.

### **FOETAL MONITORING**

Literature on foetal monitoring is easy to find and access in a variety of forms, both in libraries, nursing, medical and midwifery textbooks and within journal articles. Topics range from the benefits to the controversies of foetal monitoring; an overview will now be presented. The foetal heart rate is commonly determined by using IA or CEFM. Both of these methods are discussed within the literature.

Auscultating foetal heart sounds during pregnancy and labour and the criterion of normal rates have been set since the later part of the 19<sup>th</sup> Century and have remained stable (RCOG, 2001). These criteria are described in foundation texts used for nursing, midwifery and medical practitioners for example: Maternal-Newborn Nursing (Olds et al., 2000), Myles Textbook for Midwives (Fraser & Cooper, 2003), and Dewhurst's Textbook of Obstetrics and Gynaecology for Postgraduates (Edmonds, 1999) as well as EBCPG, such as those from the Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG), (2006), Society of Obstetricians and Gynaecologists of Canada (SOGC, 2002), Royal College of Obstetricians and Gynaecologists (ROCG, 2001) and the American College of Obstetricians and Gynaecologists (ACOG), (1995). These bodies (RANZCOG, SOGC, ROCG, ACOG) are recognised as leading authorities on reproductive health care and produce national clinical guidelines on important women's health issues.

### **Intermittent Auscultation (IA)**

IA has been reported to be easy and efficient in detecting normal characteristics of the foetal heart rate and rhythm, including accelerations of the foetal heart rate (Goodwin, 2000). Abnormalities in the foetal heart rate, such as bradycardia or tachycardia, can also be easily detected (Goodwin). If however, there are sudden changes in the foetal heart tones in between auscultation, this may go undetected (Morrison et al., 1993). In 1950, Cox, an Australian, identified that when foetal heart rate abnormalities detected by IA were combined with other clinical indicators, for example, meconium stained liquor, perinatal mortality and morbidity were increased, further supporting the efficacy of IA in detecting foetal distress in labour (Flood Chez, Harvey & Harvey, 2000). The use of IA to monitor foetal health during labour was known as an efficient and reliable

method to monitor foetal health during labour and associated with improved foetal outcomes (Flood Chez et al., 2000). Unfortunately, there has never been a randomised controlled trial (RCT) to prove or disprove the effectiveness of IA (Parer, 2003).

In the late 1960s, a landmark report was published resulting in IA being rejected as an efficient method to identify foetal distress resulting in neurological injury (Flood Chez et al., 2000). The report was published just prior to the introduction of the CTG machine in the United States. The research underpinning the report was conducted by a collaborative project involved 14 academic institutions and two branches of the National Institutes of Health. It reported on data on 24,863 labours of singleton pregnancies in the United Kingdom. This study would be viewed as significant because of the large sample size (n = 24,863) and the credibility of the institutions involved in the study. The collaborative project studied cerebral palsy, mental retardation, other neurological diseases and blindness linked to foetal distress in labour. The collaborative report indicated that IA was not reliable in decreasing the incidence of neurological outcomes as a result of foetal distress in labour. This study concluded that IA was an inefficient monitoring method to indicate the health status of the foetus during labour (Flood Chez et al.). Thus, when the CTG machine was introduced, the ability to measure detailed characteristics of the foetal heart rate was welcomed with the hope of an increase in early detection of foetal hypoxia before it led to death or disability (RCOG, 2001).

### **IA or CEFM**

With the introduction of CEFM, clinicians had a choice about which method of foetal monitoring to use. CEFM offers more detail about the foetal heart rate than IA. Details, such as heart rate baseline variability and the recording of decelerations of the foetal

heart rate on the graph paper, offer the clinician an opportunity to measure and analyse more characteristics about the health of the foetus. For example, baseline variability, or the minor fluctuation of the baseline foetal heart rate, normally ranges from 3 – 5 bpm and is known to reflect healthy activity of the sympathetic and parasympathetic nervous systems (Olds et al., 2000). This can be measured by examining the CTG tracing; however, these minor fluctuations are immeasurable by the human ear when simply listening to the foetal heart during IA (Morrison et al, 1993). Foetal heart rate patterns, including decelerations, can be examined more efficiently with CEFM using amplitude and examining the association of decelerations with uterine contractions. Characteristic patterns, such as ‘late decelerations’, are found useful in diagnosing foetal distress (Goodwin, 2000). This evidence further supported that CEFM was the preferred method to monitor the foetal health status in labour.

Since the introduction of CEFM, literature on foetal monitoring has been dominated by CEFM. For example, Dewhurst’s Textbook of Obstetrics and Gynaecology for Postgraduates (Edmonds, 1999) dedicated an entire chapter to the use of and interpretation of CEFM, yet gives little detail on methods and techniques of using IA. This may be appropriate when medical officers predominantly focus on high risk labours, but does not equip medical officers for consultation regarding low risk women. This is important in maternity care settings where midwives and medical officers offer one another collegial support. There also appears to be a dominance of articles published in journals on CEFM since its introduction, however as controversies have surfaced about CEFM, more articles pertaining to the use of IA are now published and there is a more balanced selection of topics on foetal monitoring.



As CEFM is being used commonly in clinical practice, concerns have been raised in the literature about clinicians losing their skills to effectively perform IA. For example, Goodwin (2000) reviewed the general principles of IA and suggested that because 85% of birthing women in the United States were monitored with CEFM, clinicians needed to update their knowledge and review their skills around the use of IA and abdominal palpation. Goodwin clearly articulated the basics of IA and the standards for frequency of IA during labour. Goodwin also highlighted the lack of consistency in recommendations regarding frequency of auscultation during labour, which will be discussed further within the sub-section of EBCPG.

A range of comparative studies have been undertaken to compare the effectiveness of IA and CEFM including these by Feinstein, Sprague and Trepanier, (2000); Morrison, et al, (1993) and Thacker et al., (2003). Thacker et al. completed a systematic review of a number of primary studies. A systematic review is considered to be the method with the highest level (Level Ia evidence on the evidence level scale) of reliability and validity (Greenhalgh, 1997). The systematic review included a number of RCT involving a total of 18561 pregnant women from many countries, including Australia, adding relevance to this particular Australian study and compared CEFM with intermittent auscultation (IA) during labour (Thacker et al.). The review compared appropriate criteria such as: the 1 minute Apgar score and rates of neonatal seizures, neonatal intensive care admissions, cerebral palsy, perinatal deaths, and operative delivery. No statistical differences were found between IA and CEFM in the Apgar scores, admission to neonatal intensive care, perinatal death, or cerebral palsy rates. However, differences were found when comparing neonatal seizures, rates of caesarean and operative vaginal delivery rates. A lower incidence of neonatal seizures was demonstrated within the CEFM group, however, no increase in cerebral palsy rates. The

value of using neonatal seizure rates as a criterion has since been questioned, with subsequent research indicating a lack of clinical significance of neonatal seizures on long term neurological health (MacLennan, 2001; Perlman, 1997). There was also an increase in operative vaginal deliveries and caesarean births recorded within the CEFM group. This finding supported that CEFM increased the rate of operative birth without decreasing neonatal morbidity and mortality (Thacker et al.).

A study with this sample size (n = 18561) seems adequate, however, to detect a significant reduction in perinatal death rates in labour by comparing methods of monitoring calculated against the odds of perinatal death rates (UK statistics: 0.8 per 1000 live births) means that this study size is underpowered (RCOG, 2001). RCOG (2001) recommends that due to the low prevalence of foetal deaths in labour, a sample size of 56000 would be needed in a RCT to test whether CEFM significantly reduces the overall perinatal mortality rate. Despite this recommendation, to date there has been no study of this size performed.

### **Efficacy of CEFM**

A variety of other research studies on the safety and efficacy of CEFM have been undertaken, including a number of retrospective observational studies and many RCT to assess outcomes relating (RCOG, 2001; Thacker, Stroup & Peterson, 1998). Initial observational studies reported a decrease in perinatal mortality, however, doubts over the methodological biases within these studies prompted more thorough investigations through the use of randomised controlled trials. Over time, a body of high quality evidence has been produced, indicating significant increases in obstetric interventions during labour linked to the use of CEFM, yet no improvement in the neonatal or maternal outcome measures (RCOG, 2001). Increased intervention rates during labour

would seem justifiable if there had also been improvements in foetal morbidity and mortality; however, the use of CEFM has resulted in no apparent improvement in long term foetal outcomes (Flood Chez et al., 2000; Hoerst & Fairman, 2000).

The efficacy and safety of CEFM was further studied using a meta-analysis to evaluate outcomes in both high risk and low risk labouring women by Thacker, Stroup and Peterson (1998). The meta-analysis process is one that uses a systematic approach to mathematically synthesise the results of a number of primary studies (RCT) that addressed the same issue in the same way (Greenhalgh, 1997). Combining and synthesising the results of several studies increases the strength of evidence. As with systematic reviews, meta-analyses are designated to be Level Ia evidence on the level of evidence scale (RCOG, 2001). The authors, Thacker, Stroup and Peterson, represented reputable research bodies that included the Centre for Disease Control and Prevention and the National Centre for Chronic Disease Prevention and Health Promotion in Atlanta, Georgia and they consulted with the Cochrane Collaboration, an international network of research investigators purporting a gold standard for evidence (Hindley, 2001). Thacker et al. (1995) examined all reported RCTs examining the efficacy and safety of CEFM during 1966 – 1994, including the Dublin trial with a sample of almost 13000. Appropriate criteria were examined, including the 1 minute Apgar score, neonatal seizures, neonatal intensive care admission, perinatal death, and operative delivery rate. These results confirmed previous results, showing a statistically significant rise in the operative vaginal and caesarean deliveries rates for women with CEFM when diagnosed with suspected foetal distress and a decreased rate of neonatal seizures, yet no long term implications on neurological health of the infants. The RCT report concluded that CEFM had not met its intended outcomes in respect of improving

neonatal mortality or morbidity and had increased medical intervention rates during labour.

The realisation that CEFM did not live up to its expectations of reducing neonatal mortality and morbidity and some studies reporting as high as a 21% increase in rates of operative vaginal birth and caesarean rates in women monitored with CEFM, prompted a discussion about whether CEFM should be abandoned (Parer & King, 2000). An article titled '*Foetal heart rate monitoring: Is it salvageable?*' raising the question of whether CEFM should be abandoned, was published in the reputable American Journal of Obstetrics and Gynaecology (Parer & King, 2000). Parer and King highlighted a number of issues contributing to the controversies surrounding foetal monitoring and reported that a greater understanding had evolved on the pathophysiology of cerebral palsy since the introduction of CEFM. Approximately ten per cent of cerebral palsy cases were attributed to intra-partum asphyxia compared to a previous belief that all cerebral palsy cases were a result of intra-partum asphyxia, when CEFM was introduced. The expectations of CEFM were therefore unrealistic.

Another issue Parer and King raised was the lack of standardisation in the analysis of foetal heart rate patterns and the management of suspected foetal distress when CEFM is being utilised. The poor reliability of clinicians involved in interpretation of the CTG tracing was also raised. Parer and King discussed ways to standardise the interpretation of CEFM and management protocols. The use of clinical practice guidelines was recommended to reduce intra-observer variation around interpretation and also to standardise management. Newer initiatives such as foetal blood sampling, were also supported within the recommendations of Parer and King.

**Interpretation of CEFM**

There is variation in the interpretation of CTG patterns, even by expert clinicians. Despite reputable obstetric and midwifery texts describing normal, non-reassuring and abnormal characteristics of CTG traces, and education and training programs to inform clinicians, individual interpretation of the CTG remains unreliable (Blix et al., 2003; Haggerty, 1999; Kripke, 1999). Clinical practice guidelines, including those from NICE, an independent body providing national guidance on health issues for the United Kingdom (2001), RCOG (2001) and SOGC (2002), have detailed in depth explanations on interpretation, documentation and management of the CTG trace to further guide clinical practice. Despite this, clinicians vary greatly in their interpretations of both the traces and the guidelines (Sharma, Downey & Heywood, 2002).

**Foetal Blood Sampling**

Complementary tests, such as foetal scalp blood sampling, are recommended in association with uninterruptible or non-reassuring CTG traces to reduce the uncertainty around diagnosis of foetal distress from the CTG trace (SOGC, 2002; RCOG, 2001). Literature on foetal blood sampling is beyond the scope of this literature review, however, when foetal blood sampling is combined with CEFM there is greater accuracy in the diagnosis of foetal distress (Devoe et al., 2000; SOGC, 2002). Because of this, CEFM should not be used unless foetal blood sampling is available to be used as an adjunct (ROCG, 2001). This offers hope that improved consistency in practice will develop in the future.

---

**The Admission Trace**

Another controversy in the foetal monitoring literature is the use of the 'admission trace'. An admission trace refers to a fifteen to twenty minute CTG trace that is often performed as an admission procedure, when women present to a birth suite. The rationale for this intervention is that any potential foetal compromise may be detected at an early point, furthermore, reassurance may be gained from a 'normal' trace (Mires, Williams, Howie & Goldbeck-Wood, 2001).

The efficacy of the admission CTG was tested by a RCT by Mires et al. (2001). The RCT targetted 1704 low risk women. These women were allocated to either the intervention or the control group. The intervention group received 'the admission CTG' and the control group received foetal monitoring by the IA method. Primary outcomes were measured by comparing cord blood pH values and base deficit to detect metabolic acidosis. Secondary outcome measures were also utilised in the study, such as Apgar scores, mode of delivery and analgesia used. No significant differences were detected between the two groups regarding cord blood results, however, secondary outcome measures were found to be elevated in the intervention group. Women who had an admission CTG were found to be more likely to experience CEFM, augmentation of labour, epidural analgesia and caesarean birth. The conclusion reached by Mires et.al, was that: "admission cardiotocography does not benefit neonatal outcome in low risk women. Its use results in increased obstetric intervention, including operative delivery." (Mires et al., 2001 p:1457). This research therefore gives no support to performing an admission trace on low risk women in labour (RCOG, 2001).

**Low Risk Labouring Women and CEFM**

Further literature was published, specifically investigating low risk labouring women and the use of CEFM, which is directly relevant to this study topic. Impey, Reynolds, MacQuillan, Gates, Murphy and Sheil (2003) undertook a RCT in Dublin with a sample of 8580 women to examine the use of the admission CTG on low risk labouring women. No differences were found relating to improved neonatal outcomes between the admission CTG and the non-admission CTG groups. However, higher rates of CEFM and foetal blood sampling occurred in the admission CTG group. There were no increased rates of caesarean or instrumental delivery in the admission CTG group. This study supported that the use of an admission CTG could not be justified (Impey et al.).

A literature review by Hindley (2001) reviewed printed material on electronic data bases from 1980 – 2001, which included twelve RCT and four meta-analyses specific to the use of CEFM on low risk labouring women. This review supported earlier studies with all findings being congruent. Hindley concluded that there is no foetal monitoring technique that can reliably predict foetal outcome and due to the increased level of medical intervention associated with CEFM, low risk labouring women should be monitored by IA. Hindley summarised that there are few good quality studies worldwide and that most have been clinical trials. This finding fully supports what has been presented in this review.

**Evidenced Based Clinical Practice Guidelines**

EBCPG have been developed worldwide in order to provide clear direction for clinicians regarding both the use of foetal monitoring and the interpretation of CEFM in an attempt to address the incongruence of clinical practice. It is clear that CEFM is not indicated for low risk labouring women (RANZCOG, 2006; SOGC, 2002; RCOG,

2001; NICE, 2001). It can also be seen that most EBCPG recommend that CEFM be used for women identified as ‘high risk’, however SOGC suggests that there is no need for CEFM even in high risk pregnancy. This recommendation is based on the condition that there is a health professional providing ‘one to one’ care for the high risk woman and complying with IA recommendations. Each EBCPG supports IA as the method to monitor low risk labouring women and offers no support for an admission CTG. A summary of recommendations about foetal monitoring from key guidelines is outlined within Table 2.1.

Table 2.1: Summary Details of EBCPG regarding Foetal Monitoring

<i>Guideline Author</i>	<i>Year</i>	<i>Recommendations about IA</i>	<i>Recommendations regarding CEFM</i>
National Institute for Health & Clinical Excellence (NICE) (United Kingdom)	2001	15 minutes apart during 1 <sup>st</sup> Stage and 5 minutes apart during 2 <sup>nd</sup> Stage.	Admission Trace is not recommended. CEFM is recommended for women identified as high risk.
Royal College of Obstetricians and Gynaecologists – (RCOG). (United Kingdom)	2001	For Low Risk Pregnancy: IA for one full minute after a contraction every 15 minutes in 1 <sup>st</sup> Stage labour and every 5 minutes in 2 <sup>nd</sup> Stage labour.	CEFM for women considered high risk. Foetal Blood Sampling facilities must be available.
Society of Obstetricians and Gynaecologists of Canada (SOGC)	2002	One to one professional support for all women. Pinard foetal stethoscope or Doppler auscultation every 15 minutes in active labour and at least every 5 minutes in 2 <sup>nd</sup> Stage. Auscultation should be carried out for one full minute after a contraction.	One to one professional support for all women. If concerns about the foetal heart tones are detected with IA, CEFM is recommended. Foetal Blood Sampling facilities must be available.
Royal Australian & New Zealand College of Obstetrics & Gynaecology (RANZCOG)	2006	For Low Risk Pregnancy. Electronic doppler should be used in preference to a Pinard foetal stethoscope. 15 – 30 minutes during active phase of 1 <sup>st</sup> Stage and at least 5 minutely during 2 <sup>nd</sup> Stage.	CEFM when risk of foetal compromise (High Risk).



---

**Barriers to implementing evidence based research and guidelines**

Changes in clinical practice seem stalled despite the introduction of EBCPG and repeated research reports stating that routine use of CEFM in low risk women increases rates of medical intervention, with no improvement in long term neonatal health. It has been suggested that CEFM continues to be used on low risk labouring women because clinicians are not convinced of the evidence that researchers have presented (Parer, 2003).

Studies have been undertaken to examine the attitudes and perceptions of clinicians towards research and links to clinical decision-making. A study by McCaughan, Thompson, Cullum, Sheldon and Thompson examining nurses' perceptions of integrating research into clinical decision-making, identified barriers including problems with interpreting research; lack of organisational support; lack of direction from researchers regarding clinical application of new findings and finally, lack of skills or motivation to utilise research (2002). McCaughan et al. found that nurses generally perceived using research as a professional responsibility and also that the educational level of the nurses was immaterial. However, two studies specific to midwifery practice have demonstrated educational qualifications as an influencing factor regarding the application of research to clinical practice (Dover & Gauge, 1995; Sinclair, 2001).

A study of midwives' attitudes to foetal monitoring specifically examined midwifery attitude toward the use of the CTG machine (Sinclair, 2001). A postal survey was sent to all midwives registered in the United Kingdom and Northern Ireland yielding a 60% response rate and 446 valid survey returns. Findings indicated that midwives preferred 'untechnological' births and identified policy and unit custom as major determinants directing CTG usage. Other factors were identified, such as medical dominance, safety

of mother and baby, and effects of litigation. Sinclair revealed that midwives in the age group 20 - 29 years with a university qualification were more likely to view CTGs as problematic than older midwives with certificated qualifications.

Midwives' preferences relating to foetal monitoring had been explored previously in 1995, by Dover and Gauge. Dover and Gauge's study explored underlying factors that influenced midwives' choices relating to monitoring methods, including educational factors. Their study was a small descriptive correlational study including 117 participants, therefore generalisations from this study are made with hesitation. Responses were obtained from midwives from a community setting, a regional hospital and a district hospital. Findings indicated that midwives in a clinical setting considered the identification of 'high risk pregnancy' to be the most important factor when determining the need for continuous electronic foetal monitoring and that the midwives preferred to use intermittent auscultation for 'low risk women'. There was speculation about the extent to which these findings reflected clinical practice, however, when the Dover and Gauge identified an 83% rate of CEFM within the specified clinical settings. The midwives acknowledged that written unit policies endorsed midwife discretion in deciding on the method of foetal monitoring to be used. Dover and Gauge (1995) suggested that 'unwritten' policy and hidden agendas underpinned actual decision-making processes within clinical settings. Recommendations suggested further research into midwives' decision-making, which supports the need for this current study.

Barriers to the clinical implementation of research were explored by Meah, Luker and Cullum (1996). These researchers explored 32 midwives' views about research and barriers to clinical implementation of research. Focus group sessions revealed that midwives viewed research as highly relevant to midwifery practice and that midwifery

involvement in research was crucial. Participants also recognised a short fall in their own involvement in research activities. They stated resources, such as time and academic ability, as barriers to their involvement. Furthermore, the participants identified difficulties accessing and making sense of recent research as other significant barriers.

A further study of 118 Swedish midwives by Berggren, (1996) supported the findings of Meah et al. (1996). Berggren explored midwives' awareness and attitudes to research by utilising a structured questionnaire. Seventy-five percent of midwives were aware of research findings in general, 65% were convinced of the clinical relevance of research and 63% were found to apply the research findings to practice 'at least, some of the time'. Berggren concluded that there was a need to further examine the midwives' decision-making framework to gain insight on how to improve implementation of evidenced based practice. Similar findings worldwide have also been identified within nursing (Hicks & Hennessy, 1997; Kajermo, Nordstrom, Krusebrant & Bjorvell, 1998; McIntosh, 1995).

These studies have predominantly relied upon the respondents' perceptions of their behaviours and honesty in reporting them accurately. Results found in these studies do not always seem to be congruent with what is seen in clinical practice. For example, the high rate of CEFM reported in Dover and Gauge's (1995) study did not match the self reported behaviours of the midwives. McCaughan et al., (2002) undertook research which not only relied upon self-reporting behaviours but included both observational and statistical modelling to analyse acute care nurses' use of research in clinical practice. Results from this research identified barriers to clinical implementation of research including difficulties in accessing and understanding research reports and

confidence issues relating to the use of research. These findings support earlier studies utilising self-reporting techniques.

An additional finding that clinicians generated internal conflict resulting from their insight into the importance of research and their inability to use it effectively was highlighted by McCaughan et al., (2002). This was more likely to occur in nurses educated in hospitals than at university and highlighted a disparity in skills specific to the use of research between the two groups. Midwifery as a profession is made up of both hospital and university educated midwives. Perhaps, this finding could be broadly generalised to midwifery clinicians, especially with the support of the findings of Meah et al. (1996), in relation to difficulties accessing and making sense of recent research. These findings will be considered during the course of this GT study to increase the sensitivity of the researcher (Strauss & Corbin, 1998).

An observational study specific to midwives and clinical barriers to implementing evidence based practice, used ethnography to identify a variety of clinical barriers that included, lack of organisational support, lack of time to attend professional updates and implement changes and lack of knowledge of research (Richens, 2002). Inadequate staffing levels and barriers with medical officers were also identified. Richens' findings further identified basic philosophical differences within the culture of obstetrics and midwifery as a barrier to the implementation of evidence based practice. Historically, strict hierarchical structures have existed between medical officers and nurses, obstetricians and midwives (McCallin, 2001). Even though midwives have been seen as the experts in 'normal' birth, their skills of being *with woman* are often undervalued and midwives are given a lower status than obstetric medical officers. Conflict was also identified between disciplines regarding the definition of 'normal' birth (Richens). If a

woman is considered ‘low risk’ then the midwife considers her ‘normal’. However, in medical terms, ‘normal’ is determined retrospectively, once the ‘normal’ birth is complete. Midwives identified medical officers as an ‘obstacle’ when medical officers often requested intervention in cases that the midwife considered ‘normal’. Only senior midwives were found to question or challenge the medical officers’ requests. This finding was previously identified by Levy (1999) in a GT study regarding midwives supporting the informed choice of women.

Stipulations made by policy and procedural documents were also cited as a barrier to midwives using evidence based practice (Richens, 2002). However, when Richen’s viewed the policy documents, the midwives’ perceptions and information about the policies were found to be inaccurate. Richens highlighted that midwives felt frustrated by not having enough time to read research or to professionally update.

Richens also identified that midwives lacked support with critical appraisal skills.

Staff shortages are another barrier to implementing evidence based practice (Richens). In Richen’s observational study of barriers to evidence based practice, staff reported that it was easier and safer to leave women on continuous electronic monitoring in times of staff shortages. Not only does this practice contravene the guidelines specific to monitoring of low risk women, but it also contravenes practices that are recommended once CEFM is ‘in situ’. It is recommended that the CTG trace is viewed and reported on at regular intervals. SOGC clinical guidelines (2001) recommend that the CTG be observed every 15 minutes and documentation written appropriately to reflect any changes. This would not be an option in times of staff shortages. It was therefore suggested that practices such as this might increase the risk of litigation against midwives (Supplee & Vezeau, 1996). Another study focusing on workload data tested

the association between midwifery workloads and neonatal outcomes (Tucker, Parry, Penney, Page & Hundley, 2003). The aim of the study was to determine the rate of CEFM related to workloads. Findings indicated a seven percent increase in the rate of CEFM associated with increased midwifery workloads, adding weight to Richen's findings that staff shortages increased the rate of CEFM.

Although Richen's (2002) research presents a relevant and current view of barriers specific to midwifery and evidence based practice, the report failed to detail the methodological process, making it difficult to thoroughly analyse the study. Nevertheless, the points that have been raised support previous studies both in nursing and midwifery and will be considered during this study.

### **Summary of Literature Review Findings on Foetal Monitoring**

Foetal monitoring has been identified as an important component of labour care within the literature. Monitoring the foetus using IA has been identified as the traditional way to monitor foetal health during labour and has been shown to be easy, efficient and results in improved perinatal mortality and morbidity (Flood Chez et al., 2000; Goodwin, 2000). Speculation exists that health professionals remain unconvinced of the effectiveness of IA because of a lack of belief in research evidence, further fuelled by the lack of a RCT to confirm the effectiveness of IA (Parer, 2003).

The literature on CEFM thoroughly describes the additional information that can be gained by using CEFM to monitor the foetus. It also highlights some of the controversies surrounding its use, including clinicians' deskilling in IA (Goodwin, 2000), increasing rates of medical interventions associated with the use of CEFM

without the benefit of improved long term foetal outcomes (Hindley, 2001; Parer & King, 2000) and disagreement over interpretation of CEFM traces (Blix et al., 2003; Haggerty, 1999). The use of CEFM has been supported for women experiencing high risk pregnancies, but deemed unnecessary for low risk labouring women (ROCG, 2001). This recommendation is clearly articulated in several well recognised EBCPG (ACOG, 1995; ROCG; SOGC, 2002). These are described and provide clear guidelines for clinicians working in the maternity settings.

High rates of low risk labouring women being monitored using CEFM (Mires et al., 2001; Supplee & Vezeau, 1996) indicate that evidence based practice is not being implemented within maternity settings, therefore this preliminary review also explored literature on barriers to implementing evidence based practice. Key research identified the following barriers, lack of skills or motivation to utilise research, lack of time and direction from researchers regarding clinical application of new findings and inadequate staffing numbers and skillmix (McCaughan et al., 2002; Richens, 2002). These findings from the literature were considered during this GT study. Literature on clinical decision-making was also reviewed prior to the commencement of the study.

### **CLINICAL DECISION-MAKING**

In this preliminary literature review clinical decision-making was examined within the context of foetal monitoring to ensure that the study topic had not been investigated previously. Clinical decision-making was also explored broadly to heighten the awareness of the researcher (Strauss & Corbin, 1998) to the current state of knowledge about clinical decision-making. Caution was maintained to ensure that familiarity with

previous research findings did not influence the researcher and limit creativity during the GT approach to the study (Strauss & Corbin).

Clinical decision-making has been broadly examined across disciplines, such as nursing and medicine, and a variety of frameworks are presented within the literature (Buckingham & Adams, 2000). Even though differing terms exist within discipline specific decision-making frameworks, it is identified that the underlying concepts within these frameworks demonstrate a high degree of similarity across disciplines (Buckingham & Adams). It is generally recognised that decision-making is made up of cognitive processes consisting of analysis of key information and cues followed by a planning and actioning phase to implement health care (Lauri et al., 2001). Intuition is recognised as an immediate recognition of a situation or pattern of events, with decision-making being based on previous experiences (Lauri, et al.).

Literature specific to midwives' decision-making was explored using two key studies (Cioffi & Markham, 1997; Haggerty, 1996). Midwives' decision-making was examined by Haggerty (1996) using a GT approach. Haggerty collected data on decision-making when midwives were faced with acute situations of foetal compromise. Haggerty interviewed eighteen midwives with greater than two years experience in both tertiary and secondary hospitals. Scenarios were used and clinicians were asked to 'Think Aloud'.

Haggerty's findings suggest that expert midwives use a blend of theoretical and experiential knowledge during decision-making. However, Haggerty points out that experiential knowledge is not an option to the novice midwife who has little or no previous experience to call on. A concern with this study was that an 'expert' midwife



was defined as a midwife with two years experience. Perhaps, a blend of theoretical and experiential knowledge was used by all midwives once they had the opportunity to be exposed to clinical practice, rather than being deemed a clinical ‘expert’. The term ‘expert’ has created debate over the years and continues to be a contentious issue. Benner (1984) implies that some clinicians may develop into experts within a short space of time whereas others may take longer. This study raised the researcher’s awareness to the notion of theoretical and experiential knowledge for the purpose of this current research study.

An Australian study examined midwives' clinical decision-making about patients in labour, using a similar process to Haggerty. Cioffi and Markham (1997) examined the clinical decision-making processes of 30 volunteer midwives with various levels of experience. Simulated case studies were used to trigger midwives to make decisions. A simple case study identifying whether a woman was in established labour was used, followed by a complex case involving an antepartum haemorrhage. Participants were asked to ‘think aloud’ during the simulated case studies. It was identified that midwives used heuristics (rules of thumb developed by memories of similar events) to take 'short cuts' in their decision-making processes. The more complex the case, the more heuristics were used. The extent of experience of the participant midwife affected the events they had to call upon, making inexperienced participants less resourceful than the experienced midwives. This study gives insight into the use of heuristics and their association with clinical experience.

### **Summary of Literature Review Findings on Decision-Making**

The preliminary literature review relating to clinical decision-making discovered a variety of decision-making frameworks across health care disciplines (Buckingham &

Adams, 2000). Even though differing terms existed within these frameworks it was recognised that the underlying concepts and cognitive processes, were similar (Buckingham & Adams). Two key studies (Cioffi & Markham, 1997; Haggerty, 1996) were reviewed specific to midwives' decision-making indicating that midwives use a blend of theoretical and experiential knowledge, with hueristics being used once a midwife developed a level of clinical experience.

Aspects of the research methodology used in these studies informed the research design for this study for example, GT methodology, the case study approach and the 'think aloud' cue during research interviews. No specific studies were found on midwives' decision-making and the use of CEFM on low risk labouring women, therefore strengthening the need for this current study.

## **SUMMARY**

Literature on foetal monitoring and clinical decision-making provided an understanding of the state of research at the commencement of this GT study. As EBCPG are not readily followed in clinical practice regarding the use of CEFM on low risk labouring women, literature on barriers to the implementation of evidence based practice was also reviewed. These barriers apply to decision-making processes and CEFM, however, there is no literature that specifically explains why midwives continue to utilise CEFM on low risk women. Further research into this specific area has been recommended to unveil the complexities of decision-making processes in relation to CEFM and low risk labouring women.

Chapter Three presents the research methods used in this study of midwives' decision-making in relation to utilising CEFM on low risk labouring women. Data collection processes and analysis will be described in relation to the principles of GT and a description of ethical considerations and methods used to ensure research rigour will be outlined.

**CHAPTER THREE: METHODS**

“Data collection, analysis and eventual theory  
stand in close relationship to one another”  
(Strauss & Corbin, 1998, Page12)

**INTRODUCTION**

This chapter presents and justifies the research design and methods used in this GT study of midwives’ decision-making. Processes of data collection and analysis are described in relation to the principles of GT, ethical considerations and rigour. The aim of the study was to explore the decision-making processes of midwives using CEFM on low risk labouring women and to identify factors influencing midwives in these decision-making processes. Study objectives were to:

- Identify and explain the clinical decision-making processes of midwives;
- Identify, describe and explain factors influencing decision-making and
- Identify and describe possible barriers to implementing evidence-based practice, specific to the use of CEFM on low risk labouring women.

The literature presented in the previous chapter identified gaps in existing research on this topic and demonstrated the importance of better understanding of the use of CEFM on low risk labouring women in the current context of evidence-based midwifery.

GT techniques, as described by Strauss and Corbin (1998) were used in this qualitative study to enable the identification and exploration of the complexities of midwives’ clinical decision-making in relation to CEFM. The theoretical framework that underpins the GT approach is described, as well as the processes of theoretical sampling and constant comparison. Excerpts from research memos, demonstrating how the emergence

of the central category and the strategies used in the theory-building phase are consistent with GT methods, support explanation of the research process.

### **RESEARCH APPROACH**

Careful consideration was given to the research approach for this study, to ensure the best fit for the purpose of the study. Central to this study is the understanding of the intricacies of decision-making processes; so using a qualitative approach enables the complexity of these processes to be identified (Polit, 2006). Qualitative approaches attempt to make sense of, and interpret data in terms of meaning, relating to the context of the situation being studied (Denzin & Lincoln, 2003). A GT approach was considered appropriate for this study as there is little specific research relating to midwives' decision-making and CEFM. This approach facilitates the collection of a wide variety of descriptive data and associated variables (Strauss & Corbin, 1998). Having a broad base of information from which to draw data throughout the research process ensures that the eventual theory is valid and reliable (Mason, 1996).

GT approaches have been used to investigate nurses' and midwives' clinical decision-making in studies by Haggerty (1996) and Levy (1999) as described in Chapter Two. Levy observed and investigated decision-making processes of pregnant women and midwives using audio taped interviews. Haggerty examined expert nursing decisions based on foetal compromise, also using in-depth interviews. These studies revealed significant and meaningful results establishing a basis for similar techniques to be used in this study.

**Grounded Theory**

GT was originally developed in 1967 by two sociologists enthusiastic about generating theory that was grounded in and discovered from data (Glaser & Strauss, 1967). Their sociological background led Barney Glaser and Anselm Strauss to believe that theories could be constructed based on the expression of relationships between phenomena, a ‘positivist’ belief. Objectivist underpinnings also influenced the development of GT, wherein the researcher is to assume an objective position throughout the study (Denzin & Lincoln, 2003).

The methodological basis of GT has its theoretical origins in Symbolic Interactionism, a sociological theory that emphasises meaning in human interactions and behaviours (Denzin & Lincoln, 2003). Symbolic Interactionism also offers an approach to sociological inquiry into human conduct where data collected from a social setting can be systematically analysed to build a social science theory (Denzin & Lincoln; Robrecht, 1995). In this study, the sociological inquiry of Symbolic Interactionism focused on midwives’ behaviours and interactions in relation to using CEFM on low risk labouring women. Systematic analysis was undertaken using GT methods, while meaning of the interactions and behaviours form the basis of the theory derived from the study.

The GT methodology evolved over time and gained credibility as a reliable research method. A clearer, more defined application process for the researcher to apply when utilising a GT approach developed, as Strauss began to collaborate with Corbin (Benoliel, 1996). Even though changes evolved through this work, the original GT methods of Glaser and Strauss were maintained, while a post-positivism approach gave a stronger voice to respondents, emphasizing respondents’ information as part of the truth

of a phenomena under study (Denzin & Lincoln, 2003). Post-positivism also presented the researcher with a greater degree of freedom to utilise creativity throughout the GT approach, recognising the 'art' of research. The 'science' continues to be maintained by data driving the direction of the research (Denzin & Lincoln). The art and science of GT methodology as detailed by Strauss and Corbin (1998) was used for this study.

#### Data Sources

Data sources are those places or phenomena from or through which you believe data can be generated. (Mason, 1996, p 36)

Data can be drawn from a variety of sources to develop a grounded theory. Sources may range from written or pictorial documents, field notes, people, and may include the researcher's own experiences (Strauss & Corbin, 1994). The method in which data is generated from the source can also be variable (Mason, 1996). For this study, midwives using CEFM on low risk labouring women were a key data source and data were generated through in-depth interviews. The data source and the method used to generate data underpin the final theory, so it is imperative that these processes are valid and reliable (Mason).

The validity of data can be measured by scrutinising the linkage between the research question and the data source, to ensure the researcher is measuring what they say they are meaning (Mason, 1996). Reliability of research can be examined by checking the accuracy of the methods and techniques used, measured against specific research recommendations (Mason). For this study, the standards of GT will be considered. The processes of theoretical sampling and constant comparison are central to the GT methodology. Data collection and analysis are continuous throughout, which informs the theoretical sampling process (Duffy, Ferguson & Watson, 2002). The next section will describe theoretical sampling in this study.

### Theoretical Sampling

Theoretical sampling is sampling based on the emerging concepts found during constant comparison of the data. These emerging concepts are described by Strauss and Corbin as the “building blocks of theory” (1998, p 102) and direct further data collection. The researcher ensures the data has broad variation and therefore the greatest opportunity for discovery, whilst making certain that both the direction of the sampling and the evolving concepts remain grounded in the data (Strauss & Corbin, 1998). For example, in this study of midwives’ decision-making, it emerged that previous experiences was found to be a major category, therefore the researcher ensured that midwives with a range of experiences in years and workplace settings would be a source of data. This enabled data to be collected to discover how different levels of experience may influence decision-making. This theoretical sampling process facilitates the comparison of key concepts such as experiences, against other properties, such as years of experiences. As the study evolves, sampling of the data becomes more specific with the researcher being directed by the evolving theory. This process requires the researcher to be patient and flexible with no set direction or timeframe for sampling processes. The theoretical sampling process is dissimilar to other research approaches, where it is common to use a preset sample and statistical significance (Strauss & Corbin, 1998).

### Constant Comparison

The process of constant comparison acts as a tool for the researcher to systematically manage large amounts of raw data, whilst phenomena are examined and related to one another to form meaning (Strauss & Corbin, 1998). Constant comparison is used to build understanding and theory, rather than to test a predetermined theory, as is done in



other forms of research (Strauss & Corbin). The process includes open coding, axial coding and selective coding (Strauss & Corbin).

Data are examined firstly by looking closely at data properties, and then compared at various levels by the researcher questioning the data and making comparisons. This results in aptly named codes and categories being formed out of the comparative processes. These codes and categories give a means for the data to be examined and understood (Strauss & Corbin, 1998). Data are initially fractured into parts and given a code or label. The data are fractured word by word, sentence by sentence with many codes forming. This coding process is known as open coding (Strauss & Corbin). As more data are examined, the researcher identifies common characteristics that link new data to previously coded data by constant comparative analysis. Eventually data with similar properties are grouped together. As constant comparisons continue, similarities and differences are identified and the data are further processed into categories. Categories are formed with data of similar or related properties being categorised together; a process known as axial coding (Strauss & Corbin).

During the coding and comparison processes, the researcher gains insights into and an understanding of the data and a framework forms to direct theory building. The interplay of comparisons continues at a conceptual and theoretical level, where categories are integrated and refined during the process of selective coding, to eventually transform understanding into the act of constructing a theory (Strauss & Corbin, 1998).

Research memos are maintained during the study, representing ideas, hunches and researcher's interpretation during analysis. These memos can be referred to at a later

time to refresh understanding, whilst the researcher constantly returns to the wealth of data to re-examine them in the light of new understanding and insights (Strauss & Corbin, 1998). Over time, a central category or main theme evolves from the data.

The central category is discovered by testing and retesting possible theories against the data, until a theme is distinguished that broadly integrates categories and encapsulates data within an explanatory entirety (Strauss & Corbin, 1998). The emerging theory can then be refined. Even though final theory building takes place at the ‘end point’ of the research process, the time taken to formulate theory is immeasurable. Theory building is continuous, possibly starting even before the research process began, within the researcher’s previous experiences and insights adding to the researchers’ ability to gain insight and understanding, as well as acting as a springboard effect into theory building (Glaser & Strauss, 1967).

Established theory is again tested against the raw data – a high level of comparative analysis (Strauss & Corbin, 1998). The final theory provides explanation, understanding, as well as predictability, as the theory is applied to similar phenomena and events (Strauss & Corbin).

#### Substantive Theory

A substantive theory will correspond closely to the particular area of study, giving an explanation to the reasoning behind a situation that can be applied to other similar situations (Glaser & Strauss, 1967). In the case of this research, the resultant substantive theory explains the processes of decision-making and how factors can influence the midwives’ use of CEFM on low risk labouring women. The substantive

theory could be broadly applied to other similar situations, such as midwives working in regional Australian hospital settings.

In summary, GT utilises the core processes of theoretical sampling and constant comparison to construct theory that is underpinned by the data. How the GT processes were applied to this study is described in the next section.

## **DATA COLLECTION**

### **Data Sources**

Data for this study were drawn from multiple sources. The primary source of data was the midwives utilising CEFM on low risk labouring women and the women's medical records used to identify the midwives that used CEFM on low risk labouring women. Literature provided background data and set the scene for the study, as outlined in Chapter Two. The researcher's memos also formed part of the data. The researcher is a midwife with 20 years clinical experience, currently working in the settings as an educator/clinician where the primary data were sourced. This background equipped the researcher with a theoretical sensitivity to the research process. The researcher's perceptions, thoughts and previous experiences were reflected in memos and linked throughout the research process. The researcher's interpretation and in-depth understanding of concepts added to the richness of the data and was integral to effective data analysis and the development of the substantive theory. Schwartz-Barcott, Patterson, Lusardi and Farmer (2002) highlighted the advantages and relevance of research being conducted by clinicians, stating that the clinical knowledge and understanding offers a vital link to the development of relevant and practical theories. At the same time, the researcher abided by research methods to ensure rigour of the study was maintained. Research rigour will be detailed later in this chapter.

**Primary Data**

It is essential to collect data directly from the primary source to obtain high quality data that are credible, relevant and accurate (Polit, 2006). The primary source of data in this case was medical records of women in labour and the midwives who decided to use CEFM to monitor low risk labouring women. The primary data includes a variety of phenomena such as midwives' current opinions, understandings, thoughts, perceptions, practices, circumstances, behaviours and emotions. This type of data is best revealed by allowing participants to tell their stories to the researcher during an unstructured interview (Duffy et al., 2002). Unstructured interviews with midwives that used CEFM on low risk labouring women, collected primary data in this study. This informal, person to person method of data collection enables participants to describe their thoughts and practices to the researcher, whilst the researcher has the opportunity to gather rich data by gaining insight into participant emotions and behaviours during the interview. Further specific information can be gathered simply by the interviewer directing indepth questioning about a particular topic. This type of freedom would not be available in other forms of data collection, such as written or telephone surveys, focus groups or a formally structured interview (Stringer, 1999). The fluidity and flexibility of an unstructured interview enhances validity compared to the rigidity and standardisation of structured questionnaires (Mason, 1996). To obtain the primary data, a recruitment process was undertaken.

**Recruiting Participants**

To identify midwives who could participate in the study and ensure data were current and relevant, inclusion criteria were set as follows:

- Midwives currently employed in a Maternity Unit that included a Birth Suite

- The Birth Suite was equipped with equipment for CEFM
- Midwives who used CEFM to monitor ‘low risk’ labouring women (See Table 1.1. Indicators for CEFM, Page 28. Low risk pregnancy is viewed as a woman in labour without any of these indicators).

The researcher initially identified two regional Queensland hospitals where midwives worked in birth suites that are equipped with CEFM equipment. The two hospitals, situated within a regional setting within Queensland were both staffed with two to three midwives per eight-hour shift. The birth suites had the capacity to care for four to six labouring women at a time, with approximately 3000 births per year occurring within the two birth suites. Using these two hospital sites for data collection was anticipated to ensure adequate opportunity to recruit participant midwives.

A data collection tool (Appendix 1: Research Data Collection - Electronic Foetal Monitoring in Labour) was specifically designed and implemented within these two Birth Suites, to identify low risk labouring women who were monitored by CEFM. Midwives working in the Birth Suites were asked to list specific details each time they used CEFM on a labouring woman. The researcher invited midwives assist in the research process at the ward communication meetings and a notice to staff was placed in both Birth Suites. The tool captured the brief details of all women in labour being monitored with a CTG machine.

The data collection tools were gathered and examined on a regular basis by the researcher to inform a process of medical record auditing. The researcher undertook medical record audits of those women being monitored by CEFM in labour to identify if CEFM was used on any low-risk labouring women. Once the researcher perceived that a

case was ‘*CEFM on a low risk labouring woman*’, the researcher conferred with the Nurse Unit Manager, an expert midwife, to ‘double check’ the accuracy of this perception. Having both midwives agree on the perceived ‘low risk’ categorisation ensured maximum research rigour. Brief details about the scenario, which led to the low risk woman being monitored with CEFM, are included in Table 3.1. This information includes data from the medical records of the low risk women.

The researcher then identified the midwife who initiated CEFM on the low risk labouring woman by means of written entries within the progress notes in the medical record (this process was completely confidential and not done with the Nurse Unit Manager). Once the particular midwife was identified, a letter and written consent form was sent via the internal hospital mail to maintain confidentiality (Appendix 2: Participant Letter & Consent). The letter detailed information about the study and invited the midwife to be involved in an unstructured interview, reassuring them that there were no consequences of declining involvement and that confidentiality would be maintained at all times in accordance with ethical guidelines. If the midwife agreed to participate, the signed consent form was returned to the researcher via the internal mail. As soon as written consent was received, the researcher promptly contacted the participant midwife by phone, to arrange a time for the unstructured interview. Ensuring the interview took place as close as possible to the time that the participant midwife monitored the low risk woman would improve participant recall and facilitate accuracy of the data (Minichiello, Aroni, Timewell & Alexander, 1995).

The data collection tools were temporarily removed from the birth suites when a participant was identified, until recruiting another participant midwife commenced. This ensured that staff were not inconvenienced by collecting unnecessary information whilst

the unstructured interview was arranged and subsequent transcription of the interview and data analysis took place.

The transcription, review and data analysis commenced immediately after the first interview and continued constantly, providing the direction required throughout the recruitment process. The process of medical record audit and participant selection through the theoretical sampling process continued until no new themes were found (Strauss & Corbin, 1998). Five midwives with a variety of years of service and experiences were recruited and interviewed during this study. The researcher's position as a Midwifery Educator within the district enhanced the researcher's contextual knowledge of the potential participants within the pool of potential participant midwives. This knowledge was utilised to ensure wide variations of participant characteristics were captured in the data. A point of theoretical saturation (Strauss & Corbin) was reached during the analysis of the fifth interview and no further participants were recruited.

### **The Participants**

Demographics of the participants were important, both in relation to the individual participants and the site the participants were drawn from, to ensure a broad variation of the data (Strauss & Corbin, 1998). Demographic data were obtained at the commencement of the interview. Collecting demographics informally at the start of the interview was found to be an effective 'ice breaker' to commence the interview process, facilitating time to establish rapport between researcher and participant, prior to more in-depth questioning. One such question related to how long the midwife had been working in the hospital setting in which the study took place. Rees (1997) suggests that

the success of an interview can be determined by the researcher's ability to quickly develop rapport with the participant.

### **Participant Demographics**

The demographic data of the five midwife participants are summarised within the following table. Participants were given pseudonyms.



Table 3.1: The Participants

<i>Participant Characteristic</i> →	<i>Midwifery Qualifications</i>			<i>Years of Midwifery Experience</i>		<i>Setting of Midwifery Experiences Across the Continuum of Care</i>				<i>Time within Current Practice Setting</i>		<i>Data from labouring woman's medical record about the use of the CTG</i>
<i>Participants</i>	<i>Hospital Certificate</i>	<i>Graduate Diploma</i>	<i>Master</i>	<i>Less than 5 years</i>	<i>More than 5 years</i>	<i>Current hospital only</i>	<i>Other Qld setting</i>	<i>Interstate setting</i>	<i>International setting</i>	<i>Less than 2 years</i>	<i>More than 2 years</i>	
Interview 1: Iris	◆				◆		◆		◆	◆		Iris was helping out in a busy labour ward. A CTG was put on for a baseline recording on a low risk labouring woman then another midwife took over care. CEFM continued.
Interview 2: Dorothy	◆		◆		◆				◆	◆		CTG put on, as an admission trace on a low risk labouring woman, busy shift – wasn't taken off – CEFM.
Interview 3: Julliette	◆				◆			◆			◆	On admission Julliette thought there was something not quite right and therefore used CEFM. According to guidelines the women met low risk criteria. (Later it was discovered woman did have a UTI – antibiotics were commenced during labour.)
Interview 4: Kaitlyn		◆		◆		◆				◆		Low risk primiparous woman with possible rupture of membranes during early labour.
Interview 5: Amber		◆		◆		◆				◆		Low risk multiparous woman with possible rupture of membranes during early labour.

Participants with a wide variety of characteristics facilitate the opportunity for obtaining maximum variation within the data (Strauss & Corbin, 1998). Variables such as level of midwifery education and years and nature of clinical experiences, added to the variety of human experiences within the participant group. This variation provided the opportunity to capture viewpoints from the perspective of each participant, giving a broader perspective for application of the study's findings.

The regional nature of the hospitals used for data collection means that results can be applied to other regional hospitals; however, they may be less applicable to a large specialised tertiary hospital in a capital city.

### **Interview Process**

Interviews were conducted as close as practicable to the time that the CTG monitoring episode was identified by the medical record audit to optimise participant recall. The interviews took place in an environment free from interruption. An environment that is quiet and free from interruption is said to enhance the flow of information and facilitate rich data collection (Minichiello et al., 1995). For example, one of the interviews was held in a small room at the back of the hospital library, which was managed by a booking system. The medical record was taken to the interview to enhance the clinician's recall during the interview.

The interviews were audio taped (after the participants consented). The benefit of audiotaping is that both a detailed and accurate account of the interview is available to be examined. Audiotaping can be viewed as a disadvantage, due to participants being more reluctant to divulge information when interviews are taped and technical difficulties can interrupt the interview process (Stringer, 1999). To diminish the risks of

these disadvantages, participants were notified as part of the consent process that the interviews would be audio taped; also, a micro-cassette recorder was used. Having a small device was less intrusive. The researcher was equipped with additional batteries and tapes and a notepad and paper to minimise technical difficulties in the event that the recorder failed.

### **Conducting the Interview**

General interviewing principles and techniques were applied during the unstructured interview to maintain rigour and ensure the collection of relevant and rich data. Initially, general questions were posed, such as:

*“How long have you worked here as a midwife?”*

*“What sort of changes have you witnessed surrounding CTG use, during your experience as a midwife?”*

These questions gave the participant an opportunity to become comfortable with the interview process prior to the researcher asking more direct questions. Minichiello et al. (1995), suggest that allowing time for the participant to become comfortable prior to more in depth questioning is an important consideration during research interviews. The clinicians were also asked to 'think aloud' during the interview. This technique has been found to be useful in producing rich data and was used by Cioffi and Markham (1997) and Haggerty (1996) during the interviews they conducted as part of their GT studies. As the participant's comfort level rose, more direct questions were framed. The researcher reflected on the first order data (the midwifery notes taken by the midwife at the time of using the CTG) within the medical record, to assist the midwife's recall as she was drawn back to reflect on her actions during the clinical event. Questions were posed, such as:

*Remember Mrs 'X', the multiparous woman in early labour in room 4, can you tell me what made you decide to place the CTG monitor on her - it may be helpful for you to talk through your reasoning by 'thinking aloud'.*

Following this, the researcher directed a variety of questions and probing statements, according to 'threads' emerging both from this participant's answers and data from previous interviews. For example:

*Researcher: "So you said about the woman being term + five days, how much does the due date affect you when you're thinking about doing a CTG; we talked about pre-term but what about when the women are getting towards post term?"*

*Julliette: I think I'd definitely do one, having had a past experience where I had a term + 14 die on me in labour....."*

*Researcher: "How long ago was that experience?"*

*Julliette: "10 - 15 years ago."*

*Researcher: "So that experience still affects your day to day [decision-making] processes?"*

*Julliette: "Oh, every single shift it will be there ....."*

By using probing questions, the researcher was able to confirm understanding, as well as acquire more detail about the phenomena the participant was describing. This process of using a range of open ended and probing questions facilitates the emergence of rich interview data (Stringer, 1999).

The first three audio taped interviews were transcribed verbatim (word for word), however, only parts of the final two interviews were transcribed verbatim. This process is supported by Strauss and Corbin (1998), who confirm that as the researcher's intimate familiarity with the data increases, less general detail is required to be recorded due to the heightened sensitivity of the researcher to identify relevant data at this point (Strauss & Corbin).

## **DATA ANALYSIS**

Data analysis began with transcription and review of the first interview. The audiotape from each interview were transcribed into a written format to enable easier examination and analysis of the data. This meant a time delay between interviews, whilst the

researcher transcribed and analysed data. This process is part of the GT method and was essential to guide the direction of the next interview (Glaser & Strauss, 1967).

Data were broken down into parts - word by word, sentence by sentence, looking to uncover meaning, thoughts, ideas or concepts by opening up the text. As concepts were identified they were given a label or code. This process is known as open coding (Strauss & Corbin, 1998). The open coding process resulted in the researcher initially coding concepts into more than 100 categories. The following example demonstrates how open coding was used to identify and label concepts within the data. This small segment was given several codes.

*Dorothy: "I've worked with home births ...hospital and home births and you don't have that facility [CEFM] available at home"*

This data segment was coded as follows,

- 'CTG availability in different settings',
- 'midwifery different from place to place' and
- 'midwifery experiences'.

Coding concepts is the beginning of the classification process. As more data were collected, the process of constant comparative analysis enabled the researcher to identify common characteristics that linked a new concept to a previously coded concept, so that eventually data with similar properties were grouped together. This is a recognised part of GT process (Strauss & Corbin, 1998). Further questioning and examination of the data resulted in a refining process that eventuated in data being reduced to 77 categories and over time, to 56 codes. Some codes seemed to be closely linked to the research question than others. Other codes appeared to be irrelevant to the topic, however no data were disregarded at this point of the analysis.

Following on from the open coding, axial coding evolved as conceptualising began with patterns beginning to form. Axial coding is the linking of coded data into categories at the level of their properties (Strauss & Corbin, 1998). Constant comparisons were made within the groups of data to confirm similarities and identify differences and to process the data further into categories. Eventually, categories were formed with data of similar or related properties being clustered together. Table 3.2 shows an example of how codes were clustered into categories.

**Table 3.2: Data Analysis – Categories formed during Axial Coding**

<i>Category</i>	<i>Codes clustered under category</i>
Feelings	Trust in technology Mistrust in colleagues Feeling reassured Feeling excited Feeling nervous Feeling safe Empathy Just knowing Maintaining control
Foetal Monitoring Practices	IA Baseline CTG Continuous CTG CTG as babysitter CTG as ‘checker’ CTG as time saver
Workloads	Staff cutbacks Not enough staff Not enough time CTG as babysitter CTG as time saver
Medico legal issues	Documenting Using chain of command to get action Blurred role delineation between dr/mw

**Source:** Excerpt from Memo: 8/12/2004

As data were sorted and constantly compared, a greater understanding was formed and selective coding facilitated data to be gradually reorganised into a framework, to help form theory and meaning (Strauss & Corbin, 1998).

Table 3.3 demonstrates the early organisation of the data into a modified paradigm framework. A paradigm (Strauss & Corbin, 1998) is a framework to organise concepts and incorporate the structure and process of the phenomenon under study. The structure ‘sets the scene’ describing the context in which the phenomenon exists, whilst the process represents the actions, interactions and consequences of the phenomenon (Strauss & Corbin).

**Table 3.3: A Modified Paradigm Framework for Categories.**

<i>‘Contextual Issues’ (Structure)</i>	<i>‘Influencers’ (Process: Actions, Interactions)</i>	<i>‘Outcomes’ (Process: Consequences)</i>
<ul style="list-style-type: none"> <li>▪ Medico-legal issues</li> <li>▪ Changing trends with how CTGs were used</li> <li>▪ Clinical setting</li> <li>▪ Professional roles and relationships</li> </ul>	<ul style="list-style-type: none"> <li>▪ Workloads</li> <li>▪ Previous Midwifery Experience</li> <li>▪ Staff Skillmix</li> <li>▪ Policy &amp; Procedure</li> </ul>	<ul style="list-style-type: none"> <li>▪ Feelings (staff feeling safe; clients feeling attended to by having CTG on)</li> <li>▪ Staff doing everything to reduce risk.</li> </ul>

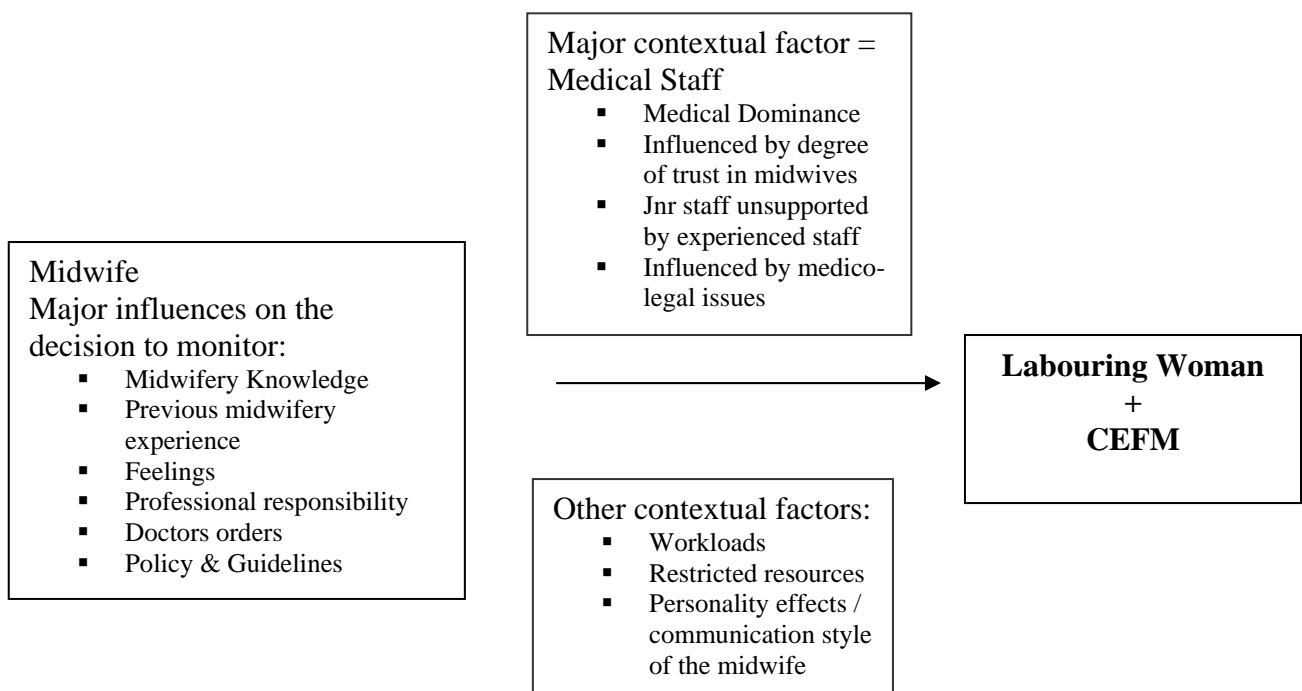
**Source:** Excerpt from memo: 12/12/2004

Using this modified paradigm framework helped to organise data by grouping categories under broader groups relating to their influence on decision-making. The categories that broadly affected decision-making were grouped under ‘contextual’ issues, whilst the categories which directly affected midwives’ decision-making were grouped under ‘influencers’. Categories that fitted under the ‘outcomes’ column represented the end results of the decision-making process. Using this modified framework enabled categories to be grouped together in a logical way and for categories that had no contextual or direct impact on the midwives’ decision-making process to be

discarded. This allowed connected data to be viewed in a more focused manner, with ideas and patterns funnelling into theory building.

Concept maps were also used frequently as patterns began to emerge from the data. Using concept maps assisted the researcher to make sense of the data and to organise it in a manner to test how the data may interact with each other. Figure 3.1 is an example of a concept map from the researcher's memos.

**Figure 3.1: Concept Map - Labouring Woman + CEFM**



**Source:** Research Memo: Concept Map. 7/12/04

As possible theories emerged and became clearer, theoretical sampling guided final data collection according to the boundaries of the emerging possibilities (Glaser & Strauss, 1967). For example, the researcher identified the need to collect further data to clarify the impact of midwives' previous experience on decision-making and CEFM. The first three midwives interviewed all had extensive midwifery experience. Under the guidance of theoretical sampling processes, the researcher interviewed two midwives with less

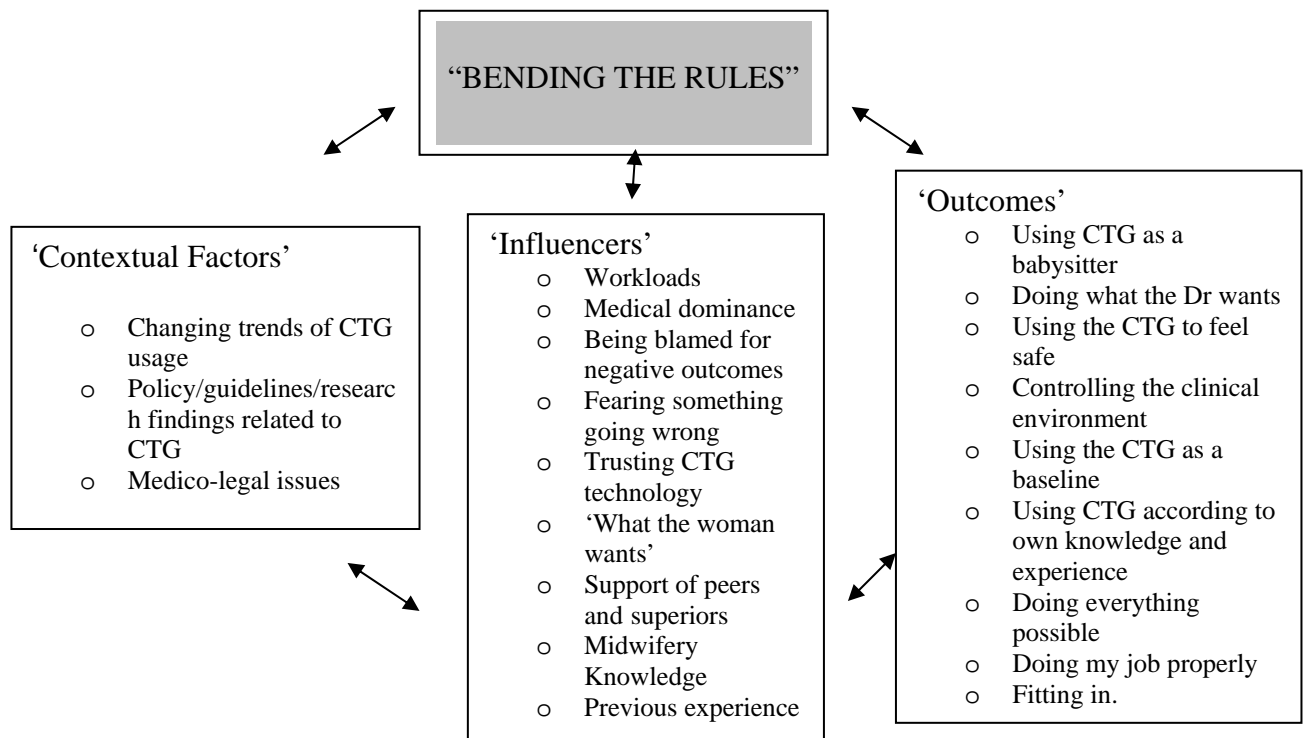


experience. As data analysis from the fifth interview was undertaken, it was recognised that no new themes were emerging and that theoretical saturation had been reached. Patterns became apparent and structure within the data was utilised to form and build theory (Strauss & Corbin, 1998).

## THEORY BUILDING

As analysis and theory building became more focused a further reduction in the categories was facilitated by the constant comparison technique (Glaser & Strauss, 1967). One theory that emerged was based around midwives 'Bending the Rules'. This theory was based on the categories interacting together (see Figure 3.2) to show how midwives 'bent the rules' according to their past experiences, workloads and midwifery knowledge.

**Figure 3.2: Concept Map – Bending the Rules**

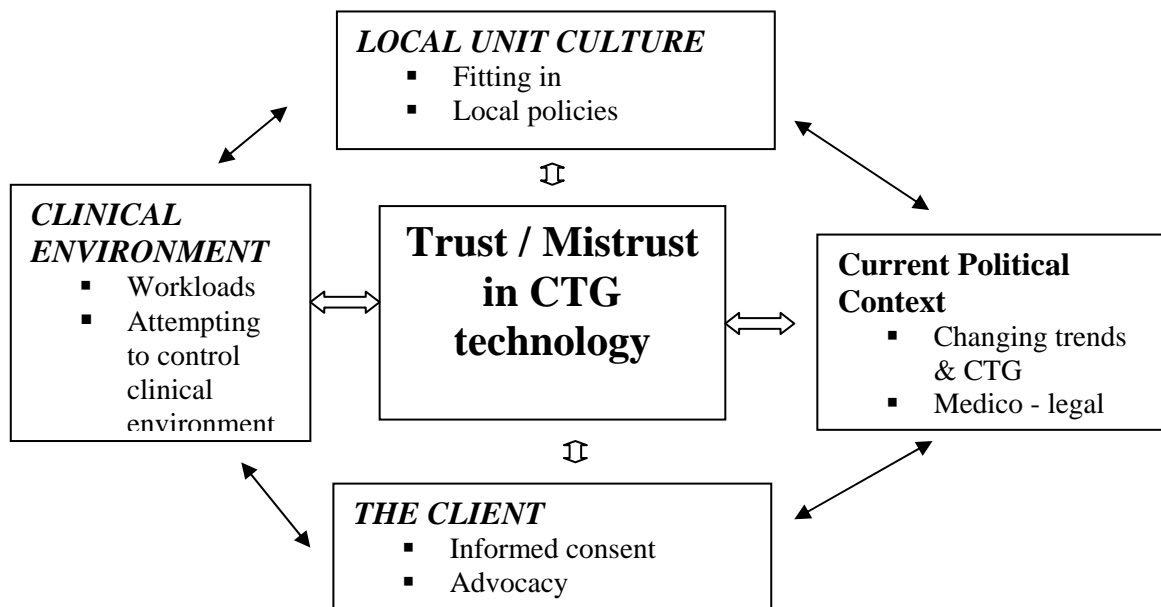


**Source:** Research Memo - Concept Map 6/11/04.

However, when this theory was taken back and tested against the data, the researcher became aware that this theory reflected data pertaining to both low risk and high risk labouring women and CEFM. As examining midwives' decision-making and CEFM on high risk labouring women was not the intention of this study, categories relating to high risk women and CEFM were discarded. This example highlights the importance of the researcher returning to the wealth of data to re-examine and test theories that begin to emerge, whilst maintaining a constant focus on the aim of the study.

Figure 3.3 demonstrates a later stage within the theory building process where trust / mistrust in CTG technology was represented as a potential core variable and how trust influenced, and was influenced by issues such as current political context, clinical environment, local unit culture and the client.

**Figure 3.3: Concept Map - Theory Building**



**Source:** Research Memo: 28/12/04

Memos were maintained throughout the research process with the researcher jotting down thoughts and hunches in note form. These memos represented interpretation;

meaning and ideas during analytical processing that could be referred to at a later time to refresh understanding (Strauss & Corbin, 1998). This process enabled the researcher to view all data within the frame of a newly generated theory. This checking process convinced the researcher that the analytical framework was accurate and again ensured that theory building was intimately linked to data. This intensive process avoided the generation of a 'typology'. Typology is a broad outcome that is not grounded in the data and is identified as a pitfall in GT research by Skodol Wilson and Ambler Hutchinson (1996).

Writing a storyline was another useful form of memoing used to integrate concepts (Strauss & Corbin, 1998). For example:

*Storyline: (8/4/05)*

*Midwives decision-making about CTG usage on low risk women in labour is strongly influenced by levels of 'trust'.*

*Some midwives trust strongly in evidenced based guidelines and local policies however are easily influenced by local practices that may not fit into either of these when they witness midwives they trust, practicing in a certain way eg: ?PROM. One very experienced midwife trusted greatly in UK research but had not been convinced of any findings more trustworthy since, so even though her practices were influenced by evidence based guidelines the midwife integrated these findings to match in with what she believed 'trustworthy' from previous experiences and her own knowledge.*

*CTGs were also found to be used as a tool to check the 'trustworthiness' of unknown staff members. Stories were told by experienced midwives that it was more common for staff to feel reassured by the CTG with 'something to look at' than that of trusting the unknown midwife's judgement that everything was OK. This demonstrates a greater trust in CTG technology over human judgement.*

*This greater trust in CTG technology also came through when experienced midwives found it reassuring to use the baseline CTG as a tool for thorough assessment on admission – they felt baseline CTGs were very important, indicating again the trust in CTG technology, was stronger than their trust in traditional methods of assessment and also a lack of trust in the woman's history of well-being. There was very little evidence of midwives trusting in the woman 'knowing' her baby was well. Both inexperienced and experienced midwives had seen situations where the CTG alerted staff of problems, which had previously been unobvious. Midwives want to 'do everything possible' to help ensure a healthy outcome for Mother and Baby, even if it does mean a greater level of intervention. Midwives' also want to feel safe and comfortable within their own practice and this influences decisions about use of CTGs and also about what*

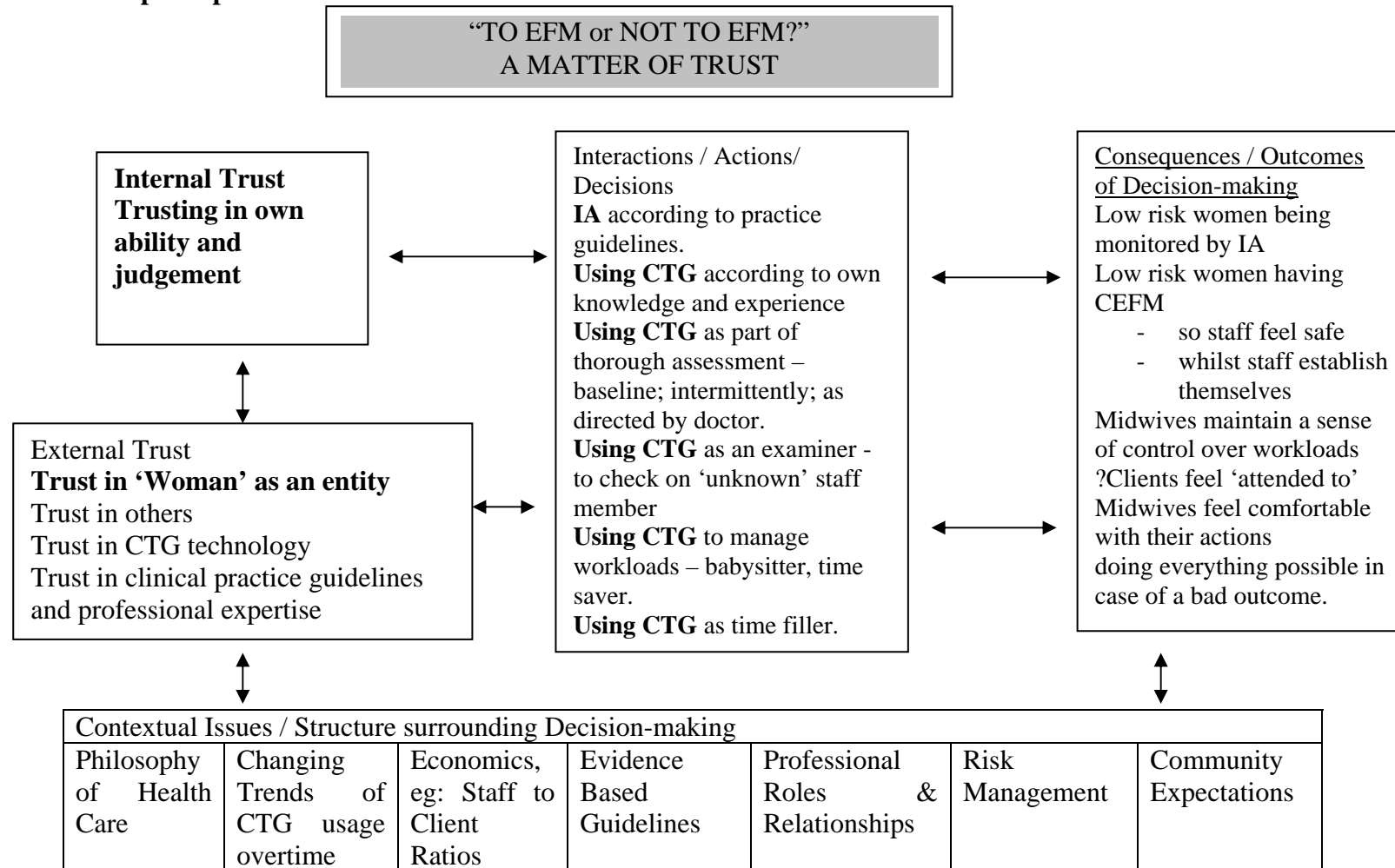
*the woman wants. Midwives appear to be willing to change their practices about monitoring so long as they feel safe and comfortable (internal trust).*

The process of writing a storyline was also helpful in identifying the central category, by enabling the researcher to express the main themes in another way, other than exploring categories and generating concept maps.

### **Discovering the Central Category**

The central category was discovered by testing and retesting provisional theories against the data. Figure 3.4 demonstrates the use of concept mapping to test the possible central category of 'trust'.

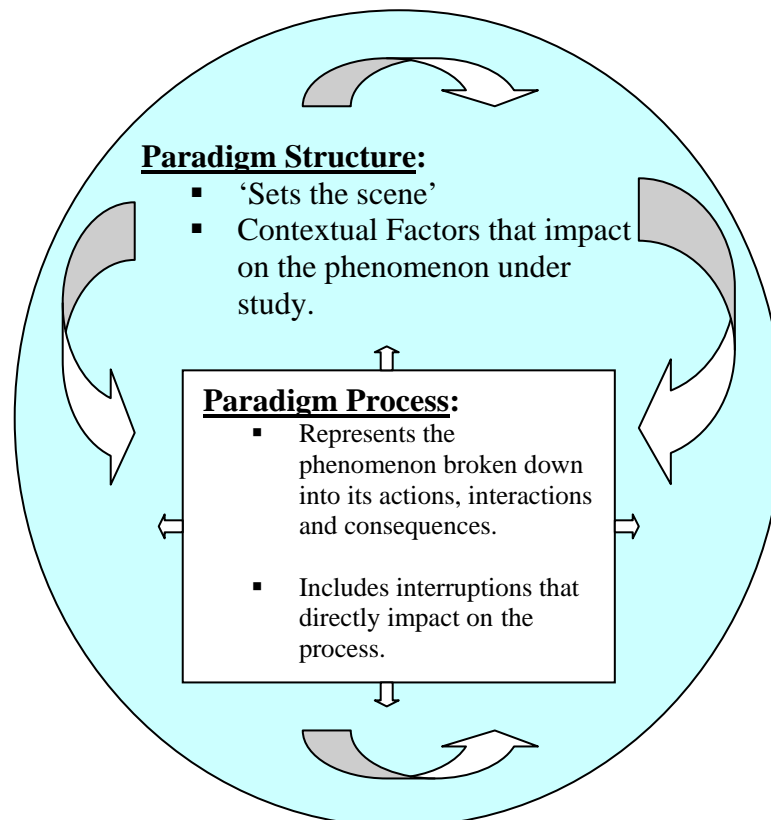
Figure 3.4: Concept Map: A Matter of Trust



Memo Date: 28/03/0

As greater understanding formed the paradigm framework was used as described by Strauss and Corbin (1998), to present data in a meaningful way. The paradigm incorporates a structure and a process of the phenomenon under study. This can be seen in Figure 3.5. The structure ‘sets the scene’ describing the conditions that form the context in which the phenomenon exists, whilst the process represents the actions, interactions, interruptions and consequences. Using a paradigm framework within this concept map helped the researcher to represent the relationship between categories within the context of the situation and further develop understanding of the event under study.

**Figure 3.5: Diagrammatic Representation of the Paradigm**



The researcher reviewed both coded and raw data to stimulate thinking and to check theory generation as recommended by Strauss and Corbin (1998). This process continued until the researcher could validate that the central category clearly fitted the data.

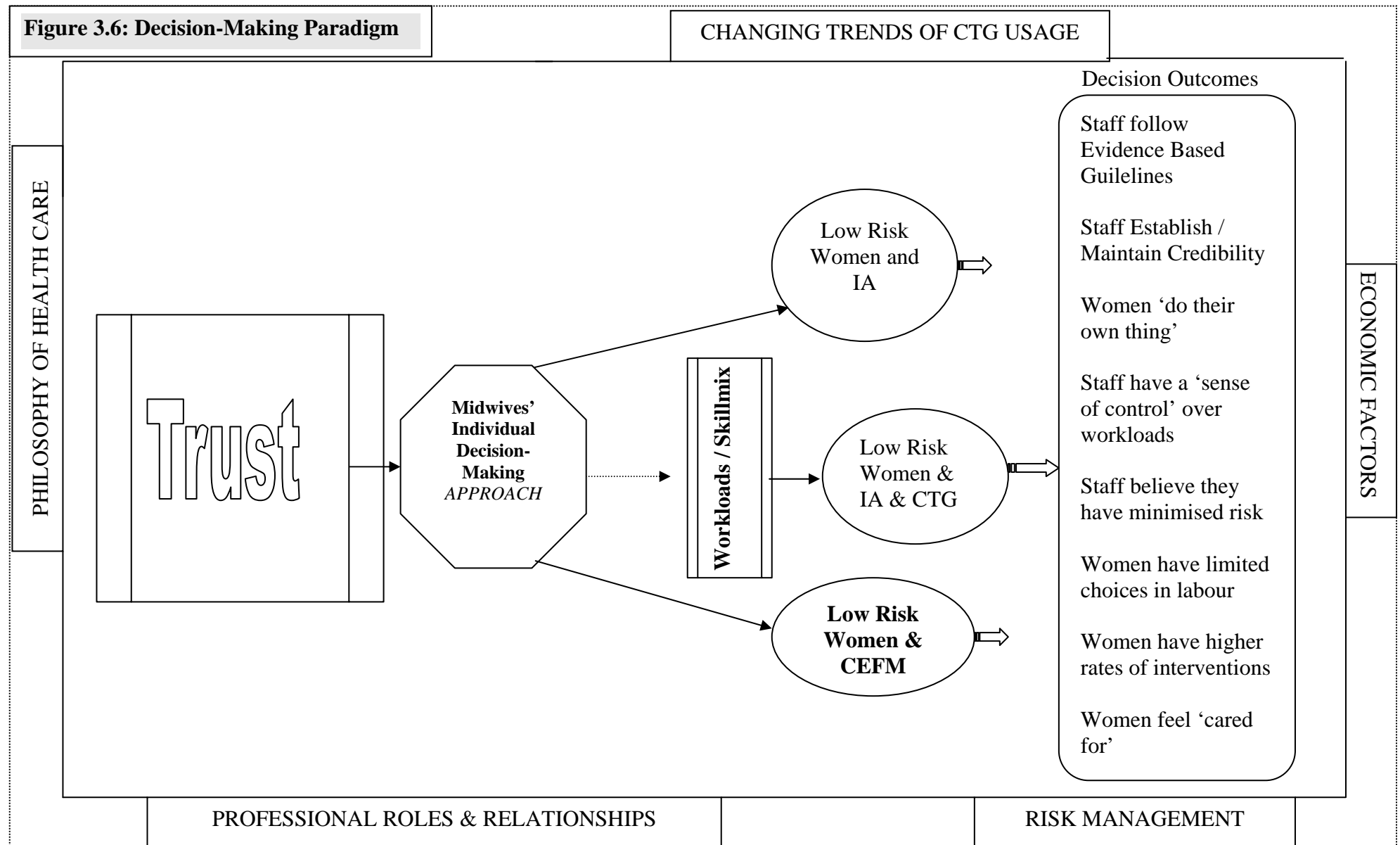
‘Trust’ was identified as the central category. How ‘trust’ interacted and influenced midwives’ decision-making would be the basis of the theory defined from this study. Strauss and Corbin (1998), support that a definition of the central category and its dimensions enable a clear understanding of the central category and how its interaction and integration link to form theory.

### **Refining the Theory**

Once theory was established, it was again tested against the raw data. GT techniques recommend a high level of comparative analysis, such as this (Strauss & Corbin, 1998). Theory development was discussed with the researcher’s supervisors, a group of student midwives and with midwife colleagues and midwifery lecturers. These colleagues all conveyed a sense of agreement that the findings ‘fitted’ their own midwifery experiences. This exercise further validated the establishment of the theory, and added rigour to the theory refining process (Strauss & Corbin).

Further representation of the theory was tested by using Strauss and Corbin’s (1998) organisational paradigm (See Figure 3.6). Integrating the categories into this paradigm ensured the data made sense according to the paradigm structure and process.

Figure 3.6: Decision-Making Paradigm





Further refining of the paradigm occurred until the researcher felt that the substantive theory was presented in a parsimonious way, a simplified manner that enables the theory to be applied to similar situations yet without being completely removed from the raw data to which it pertained (Strauss & Corbin, 1998). The final results and the substantive theory that *midwives are strongly influenced by trust when making decisions to use CEFM on low risk labouring women* will be further detailed within the next chapter.

### **MAINTAINING RIGOUR**

Achieving credibility, dependability and transferability throughout the research processes were imperative to maintain rigour (Polit, 2006). The concept of transparency supports the transferability of the study (Mason, 1996). Detailing the demographics of both participants and sites from which primary data was collected, in a transparent manner, adds to the extent to which the findings can be transferred to similar settings or situations. Research methods and processes have also been described in a detailed and transparent manner within this chapter to allow the reader to judge the accuracy and validity of the process. Diligently following GT methods, according to Strauss and Corbin (1998) and strictly following their processes, ensures an accuracy and consistency that is associated with the known credibility of GT (Mason, 1996).

Audiotaping each interview enhanced the accuracy of data transcription and interpretation ensuring data dependability. This process enabled the researcher to faithfully transcribe the interview, verbatim, in an accurate manner. The voice tones used by participants, as well as emphasis on different phrases during interviews, assisted the researcher to identify sensitive data and added insight into the process of accurate interpretation of the data. Stringer (1999) states that the unstructured interview offers

the researcher the opportunity to capture additional rich data by being sensitive to such nuances, adding to the accuracy of the results. The audiotapes could also be replayed at a later stage of analysis, if clarification was needed on a particular topic. Sensitivity of the researcher to subtleties was further enhanced by the researcher's background in Midwifery. This background provided an appropriate platform from which to build understanding.

Strauss and Corbin (1998) state that the recommended qualities of the researcher using GT should include: appropriateness, credibility, intuitiveness, receptivity and sensitivity. The researcher's position as Midwifery Educator granted her an immediate level of credibility within the facility. The experience gained within this position also facilitated the researcher to develop an in depth knowledge of hospital culture and processes, as well as the clinical exposure to issues surrounding CEFM. This knowledge was found to enhance intuitiveness, receptivity and sensitivity as data were collected and coded.

Data generation and analysis were conducted using methods prescribed by Strauss and Corbin (1998). For example, towards the end of theory development, some researchers recommend turning to the literature to look for support of their findings (Polit, 2006); however, to ensure that the researcher was not influenced by anything other than the data, reviewing the literature was purposely avoided to maintain a high level of rigour until data analysis was complete. An attitude of scepticism was also maintained as theories developed to ensure they remained provisional until further data were collected to test and confirm their accuracy (Strauss & Corbin, 1998). Provisional theories were constantly questioned and tested against both raw data and coded data, to increase

accuracy. Regular discussions with research supervisors also added greater insights and different viewpoints to interpreting the data.

Finally, testing final theory construction to a wider audience further increased the rigour, with listeners from the midwifery setting finding a ‘fit’ of the theory to what they experience within their own clinical practice. This was done informally as part of conversations that the researcher initiated with midwife colleagues, as well as via formal presentations to midwifery students and midwives at research presentations held at Australian Catholic University.

In summary, accuracy, validity, credibility and transferability were considered and maintained throughout the research process to ensure a high level of rigour was maintained. This level of diligence was also applied to ethical considerations during the research.

## **ETHICAL CONSIDERATIONS**

An attention to detail was also maintained throughout the research process to ensure consideration of ethical matters, such as confidentiality and informed consent. Ethics committees within the hospital district and the University also monitored this process.

### **Ethics Approval**

Ethics applications were submitted to and approval granted by both the Australian Catholic University Human Research Ethics Committee and the Ethics Committee of the Health Service District in which data collection was undertaken (Appendix 3: Ethics Approval). Ethics applications included a sample letter and consent form, which

outlined the aims of the research and requested participant's written consent to become involved in the research process, including the audiotaped interview with the researcher. Midwives consented to participate by returning the researcher's copy of the consent form to the researcher and keeping one copy for their own records. A time was made for the interview that was suitable to the participant.

Prior to the interview, participants were informed that there were no 'wrong' answers as recommended, to reduce participant vulnerability and 'protective' responses (Grbich, 1999). Participants were informed they may withdraw from the research at any time without consequence and those persons declining to be involved were in no way disadvantaged by their decision. A high level of ethical integrity was maintained to ensure confidentiality.

### **Confidentiality**

Data confidentiality is imperative throughout the study and in publications from this study. Confidentiality of data was maintained by the safe keeping of all records as well as the professional behaviour of the researcher being maintained. The researcher's intent was to collect rich data, but not at the cost of embarrassing colleagues, being deceptive or causing any emotional turmoil to others during the course of the research. To maintain the midwives' anonymity, the letter and consent form was sent via the internal mail within the hospital setting. Care was taken when discussing the data, that confidentiality of participants was maintained (Grbich, 1999). De-identification processes of all data were undertaken to ensure confidentiality. For example, names were not used on transcribed interview data, simply, "I" for interviewee and "R" for researcher were used. Data was stored onto computer files or hard copy as "Interview 1 – 5" without the detail of names. During the 'writing up' phase, pseudonyms were

allocated for convenience. Any publications that are written relating to this research will also contain pseudonyms.

Consent forms which detailed names of participants were kept in a separate locked filing cabinet to the data. Data were stored in a locked filing cabinet within the university office of the researcher's supervisor. Details regarding confidentiality and data storage were required to be submitted on a regular basis for monitoring by the ethics committees.

Maintaining ethical consideration throughout the research, by methods such as these, demonstrated a respect for participants and at the same time added to credibility of the research process.

### **SUMMARY**

This chapter explained GT as a research approach and identified how it was appropriately applied to the research processes pertaining to this study. Methods used for data collection and analyses were outlined including how 'trust' was identified as the central category. The use of concept maps and story lines were summarised to demonstrate how the substantive theory evolved from the data. Information was detailed about how the researcher maintained rigour and ethical conduct throughout the research process.

In the next chapter, results of the research will be presented and discussed in detail.

---

**CHAPTER FOUR: RESULTS**

---

**INTRODUCTION**

This study set out to explore the midwives' clinical decision-making processes in using CEFM on low risk labouring women, which is contrary to current EBCPG. The main findings from this study are reflected in a clinical decision-making pathway with two key decision points relating to foetal monitoring. The midwives applied their own personal schema of clinical risk rather than EBCPG when deciding to use CEFM. Consequently women categorised as low risk according to EBCPG were monitored using CEFM. Factors impacting on the midwives' decisions were also identified.

It emerged from the data the midwives gathered initial baseline information to form the foundation of an individualised assessment of each labouring woman. Despite EBCPG, some of the midwives used a baseline CTG rather than IA to assess foetal well-being at this point. Then based on the individualised assessment, the midwives used their judgement to categorise the labouring women according to clinical risk. Women who were categorised as high risk were considered to require CEFM and the low risk women to require IA; however, some of these categorisations were incongruent with EBCPG.

The context of contemporary maternity care and more specific factors such as workloads, skill-mix and the midwives' philosophy and previous experience were also found to influence the decision to use CEFM. The decisions involved complex cognitive processes, which were influenced by the midwives' trust in CTG technology, their colleagues, workplace policy, woman's ability to be in tune with their baby's well-being

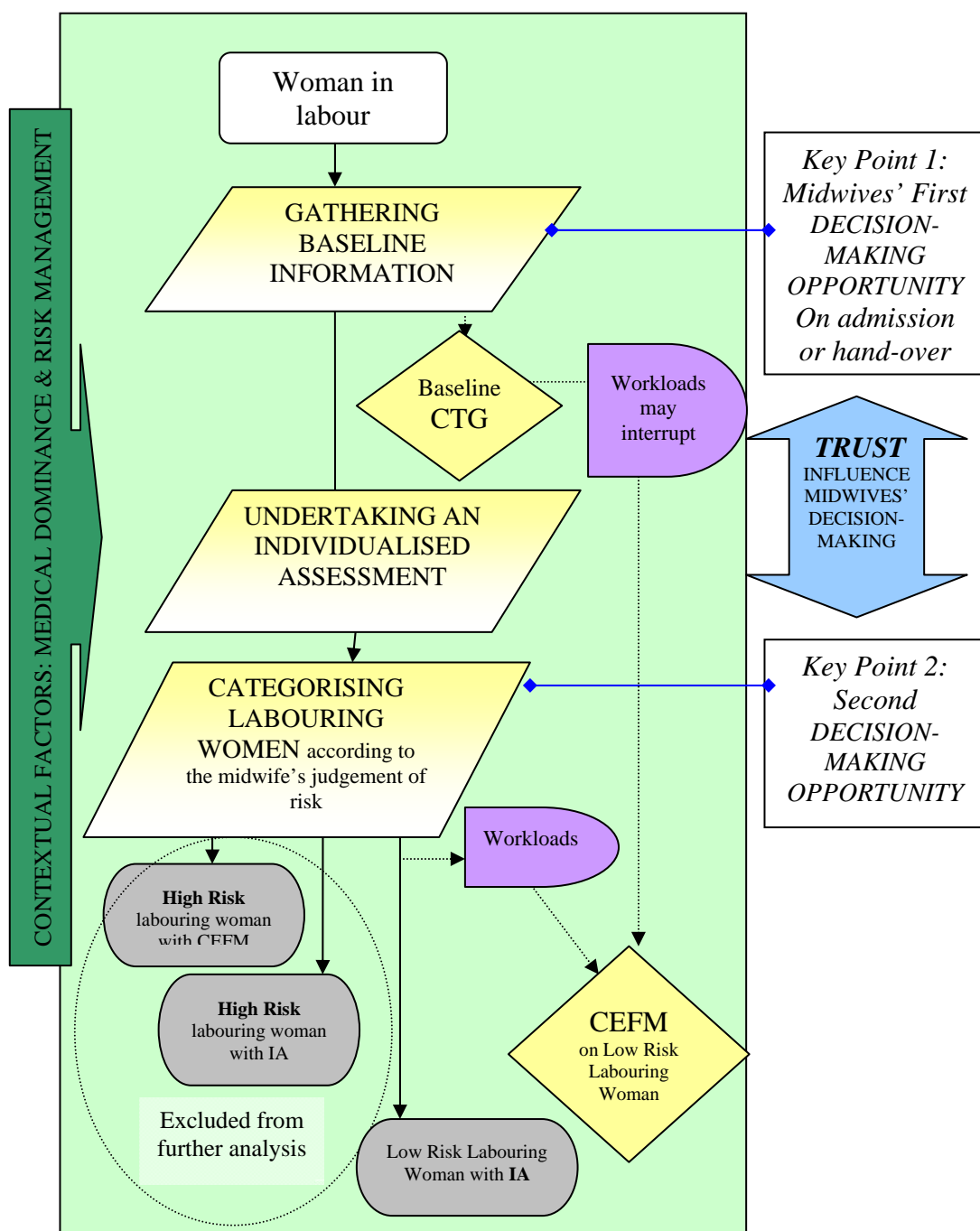
and in their own clinical judgement. A model of the decision-making pathway with the two key decision-making points and influencing factors is presented in Figure 4.1.

The findings were integrated and shaped into a substantive theory of *Midwives' CEFM decision-making, despite evidence based guidelines* with Trust emerging as the core category. This parsimonious theory (Strauss & Corbin, 1998) will be explained and described in this chapter using a paradigm (Strauss & Corbin) as the framework so that the theory's complex concepts can be presented clearly in a narrative version. The paradigm incorporates the structure and processes of the phenomenon under study. The structure 'sets the scene' describing the conditions that form the context in which the phenomenon exists, whilst the processes represent the actions, interactions and consequences of the phenomenon. The structure and processes are inextricably linked (Strauss & Corbin). The categories that emerged from the data, designated as structure or process within the paradigm, are presented in Figure 4.2. The actions, interactions and interruptions are also reflected in the decision-making pathway. The consequences are the outcomes of the midwives' foetal monitoring decisions.

To further demonstrate the common concepts between the decision-making pathway and the paradigm, a colour coding scheme has been used in both Figures 4.1 and 4.2. Green shading represents the overall influence that the contextual categories of Risk Management and Medical Dominance have on midwives' decision-making. Yellow shading identifies decision-making actions that lead to a decision. Blue shading highlights the midwives' cognitive interactions during decision-making, which incorporate the dimensions of the core category of Trust. Purple shading shows

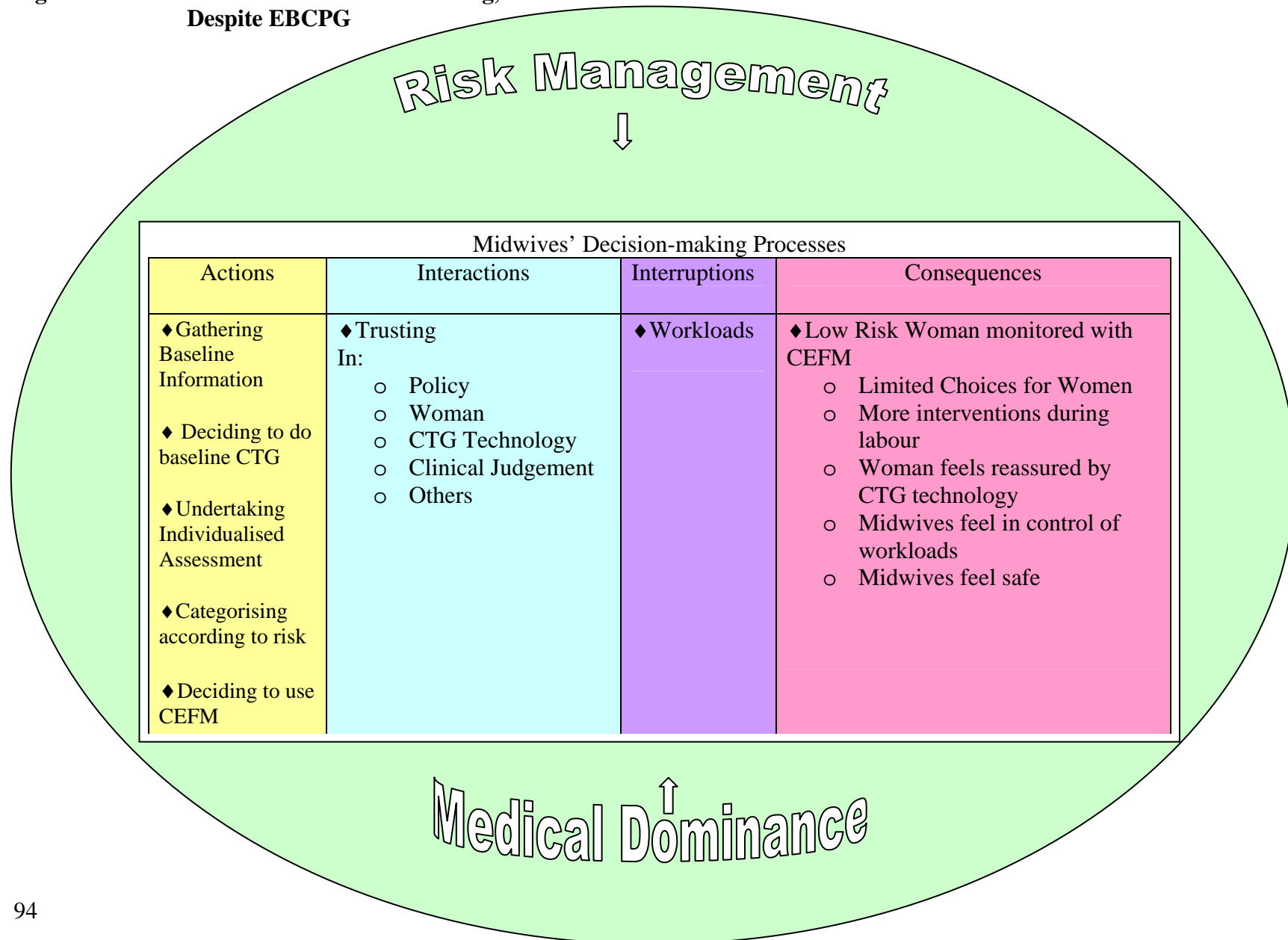
interruptions to the flow of decision-making, Workloads, and pink shading represents the outcomes or consequences of the midwives' decision-making. These figures will be referred to throughout this chapter to provide key signposts in a detailed description of the core category of Trust and the other categories in the theory. Verbatim quotes are used throughout the chapter to support the findings and demonstrate how findings are grounded in the data.

**Figure 4.1: Midwives' Decision-Making Pathway and Factors Influencing the Use of the CTG on Low Risk Labouring Women**





**Figure 4.2: Midwives' CEFM Decision-Making,  
Despite EBCPG**



---

**MIDWIVES' DECISION-MAKING ABOUT CEFM, DESPITE EBCPG**

The theory of *Midwives' decision-making about CEFM, despite EBCPG* explains how and why midwives' decide to use CEFM for low risk labouring women despite clinical practice guidelines to the contrary. Contextual factors reflected in the categories of Risk Management and Medical Dominance will be described and explained to provide the background in which the midwives decisions are made. The actions will be presented to explain the decision-making pathway and the key decision points along the pathway. This will be followed by an explanation of the core category of Trust, which impacts on the decision-making process as interactions with all other categories. Interruptions also impact on decisions at the key decision points so will be described next and finally the consequences of the midwives' decision to use CEFM on a low risk woman will be described and explained.

**THE MIDWIVES' DECISION-MAKING ENVIRONMENT**

Broadly related categories, referred to as conditions, emerged from the data to represent the structure of the midwives' decision-making environment. This structure 'sets the scene' of the decision-making environment for the midwives in this study and had a broad effect on the decision-making process as a whole. The structure incorporates the two conditions titled: Risk Management and Medical Dominance. In Figure 4.2, the green shaded oval represents the decision-making structure. The oval encircles the decision-making processes; indicating the surrounding and continuous effect Risk Management and Medical Dominance have on midwives' decision-making. How they impact on and how they are linked to the other categories will now be explained in the context of the data using data segments as the basis for the explanation.

---

**Risk Management**

The Risk Management category encapsulates the perceived actions that are viewed by the midwives and medical officers to minimise the risk of an adverse health event occurring in relation to maternity care. Risk management is a common term in the current climate of health care (Hirst, 2005); therefore it seemed an apt term for this category. This category has a general influence on many decisions made within the clinical area, including the use of CEFM. This category is linked to the core category of Trust within the decision-making process by its influence on the level of caution exercised when making decisions.

It emerged from the data that the midwives acted in a manner that would ensure they did everything possible to reduce the risk of an adverse event when caring for a family. Also, if an adverse event did occur, the midwives wanted to be able to justify their every action. The following verbatim quotes represent Iris's and Dorothy's perceptions:

*Iris: I guess I feel that if I do my job properly then I won't get into trouble, I mean it's a silly way of saying it...if I do everything properly, I monitor them closely, I give them all my time and then if something did go wrong, well then, what happens, happens - from time to time... you see that, I've seen it happen in different places and I've seen it happen before, and it just happens, you can't do much about it.*

And

*Dorothy: The main thing is that you acted at an appropriate time so that you didn't compromise that baby whether it ends up as a vaginal delivery or a Caesar, you want the baby to come out in as good condition as possible.*

These data demonstrate the midwives were diligent in their daily practices to ensure that all possible measures were in place to reduce risk; even if it meant implementing a higher level of intervention, including the use of CEFM, to justify their actions should an adverse event occur.

A link between past trends of CTG usage and Risk Management behaviours was also identified. Data from the more experienced midwives strongly reflected the influence of past trends of using the CTG during their career. For example, one midwife stated:

*Iris: I feel that it's been a bit of a wave actually; when I started it was hardly ever being used and then say going back, what is it? ... 20 years since my training...then at about the middle of that time.. about 10 years back, it was being used all the time, the women were being strapped to the bed the whole time and now, they are being used less than what they were and particularly now they are being used as a baseline observation...*

This is typical of the data from the more experienced participants. Experienced midwives have seen many changes with how the CTG has been used, particularly in relation to risk management approaches in medicine and midwifery. Their continued use of CTGs on low risk labouring women, particularly the baseline trace (described further within decision-making processes), demonstrates that the more experienced midwives considered that the baseline CTG was an effective action to reduce the risks of an adverse event.

Some of the midwives also talked about adverse events and their perception of how these experiences impacted on their clinical practice. Adverse events seemed to increase the use of CEFM as a precautionary measure, to reduce the risk of this adverse event occurring again. For some midwives, these incidents had long lasting effects as shown in this data segment:

*Researcher: When you say you would definitely do one [CTG] post term, so at what point post term would you think?*

*Julliette: As soon as they hit that estimated date [the due date], ...probably that goes on a personal experience from a Term+14 [foetus that was overdue by 14 days] that died.*

*Researcher: How long ago was that experience?*

*Julliette: 10 - 15 years ago.*

*Researcher: So that experience still affects your day-to-day processes?*

*Julliette: Oh, every single shift it will be there.*

This quote demonstrates how this particular adverse event impacted on this midwife's thoughts and decision-making over a ten to fifteen year period, showing the potential impact of such events. One of the midwives with less than five years experience had noticed this phenomena during her practice, as shown here:

*Amber: Probably if they [midwife colleagues] have been involved in an incident they are more likely to be prone to intervene more.*

Risk Management influenced the midwives' decision-making by increasing the rate of CEFM as a precautionary measure in the hope of reducing the risk of an adverse event. This was particularly evident in the immediate period after the midwifery or medical staff had experienced an adverse event. These actions also demonstrate the link from this condition to the processes of decision-making, particularly the category Trusting in CTG Technology.

### **Medical Dominance**

Medical Dominance refers to the overall influence that medical officers have on the use of CEFM within the culture of the health care setting. It encompasses all levels of medical staff decisions from trainee medical officer, junior medical officer and specialist and their actions that restrict the autonomy of midwives and women. Medical dominance as a category broadly affects midwives' decision-making and therefore fits within the structure of the paradigm.

Medical Dominance was identified as part of the culture of the local setting where the midwives practiced. Dorothy, an experienced midwife, who previously had worked in the United Kingdom, demonstrated this notion within the following comment:

*Dorothy: I'm used to looking after a woman who is a normal low risk pregnancy in labour and then if something goes wrong, then I get the doctor involved. It's*

*like they are invited into the room, but until that point you don't [have the doctor involved]. But here it's the opposite – doctors... they're just involved from the word go and it means that the decision-making is taken from you.*

This data segment demonstrates that the environment in this Queensland regional hospital was characterized by a greater level of medical involvement during labour and birth and a blurring of professional boundaries, more so than where Dorothy was previously employed (in the United Kingdom). Iris also reflected on her experiences of working in outback Australia:

*Iris: it totally depends on the Medical Superintendent, they have a very patriarchal system in the bush, even though it is changing slightly now, in the past whatever the Med Super believed on Mothering, Midwifery or whatever .... that governed the approach the whole hospital took towards it.*

This segment demonstrates the dominance of the Medical Superintendent over the entire hospital environment including maternity care. Julliette also discussed medical dominance during her interview and displayed a high degree of frustration, as seen in the following quotation:

*Julliette: "they're [medical officers] calling every shot. If they [medical officers] deem that you do a CTG ..... then you have to do it. I think this is so hypocritical of what we have written into policies and so on, and its not proven that it is going to be of any benefit.*

This segment demonstrates how individual medical officers exert their dominance over the midwives, even when their orders conflict with hospital policy. The culture of medical dominance was noticed by some of the midwives more so, if there had been a recent adverse clinical event. In the following quote, Amber reflects on differing medical practices following adverse events:

*Amber: When clinical incidents do happen I find the doctors are more imposing than when, you know, in between times. They kinda tense up and want to 'do, do, do' and it feels like there is more intervention happening than in times when there isn't a clinical incident fresh in their memory.*

This data segment demonstrates that medical officers are more likely to intervene and impose orders, for example, CEFM, more frequently after experiencing a clinical incident. This also demonstrates a link to the Risk Management category described previously.

### **Training medical officers and medical dominance**

Medical officers and midwives both undertake a training and education program within the hospital settings selected for this study. Student staff members, including Registered Nurses training to be Midwives, and Registered Medical Officers training to become Obstetricians, are included in the core staff of the hospital. There was little reference to student midwives, however, having training medical officers within the environment was found to broadly impact on the midwives' decision-making on CEFM. Junior medical officers on the training program often rotated to these regional hospitals following initial exposure to obstetrics within tertiary hospitals, where the majority of labouring women required CEFM due to high risk pregnancies. These medical officers were reported to have little knowledge of evidence based practice and policies on CEFM for low risk labouring women. Consequently, the midwives reported that they often ordered a CTG trace for no apparent reason, as reflected in the following quote:

*Amber: some of them [medical officers] are great and they trust what you say and they're fine and they really know what they are doing but particularly the newer ones, they come in and they just expect that we do them [CTG] as apposed to doing them for certain reasons.*

This data segment demonstrates how some new medical officers expect all labouring women to have CEFM. Junior medical officers receive training from the senior trainee medical officers and the obstetricians on staff, however, with medical officers being required to staff the hospital for 24 hours / day, the junior medical officer is often only supported by the Obstetrician via phone communication. The direct relevance of

medical supervision within this study is the outcome of junior medical officers ordering unnecessary CEFM. Julliette reflects on this situation in the following quote:

*Julliette: its when you get the new persons [junior medical officers] in who are really trying to establish themselves as well. I think I've got a wealth of experience to offer them but I don't think always the midwives are respected. There's a 'little' power struggle, um perhaps I don't have as much [difficulty with ensuring CTG policy is followed] probably cause I tend to stand up for myself and I will tend to argue the point, but there is a bit of a power struggle because the junior doctors are trying to find their feet, they are trying to be assertive, they are being directed by consultants from a distance, who are never there to see or experience how we actually work individually or in an autonomous fashion in the labour ward. They are never present unless they've got a vacuum in their hand or a forcep. That's the only time you see them in the labour ward. Oh, unless they want you to attend the 8 o clock meeting for a learning experience*

This data segment is representative of this midwife's perception that medical officers attempt to exert dominance over midwives, even when the midwives have a wealth of professional expertise and local knowledge and the medical officers are new and inexperienced. The resulting sense of frustration was evidenced clearly by the tone and expressions that Julliette used throughout the interview. Julliette's comment about the obstetrician's wanting the midwives to attend eight o'clock meetings so the obstetrician could teach them skills is an example of the type of language used by Julliette that reflected her view of a lack of interdisciplinary respect from medical officers. The category of Medical Dominance impacts broadly on the autonomy of the midwife and midwives' decision-making and CEFM, with medical officers often ordering CEFM for low risk labouring women.

Some of the midwives reported that they would question the medical officer's orders. In this quote one midwife discusses her way of approaching the medical officer to create a shared learning opportunity:

*Amber: "I think it's the way you approach them about it too. You know if you approach things with an open mind - it's different in an emergency situation, but if it's not an emergency and you approach it in a way that you want to*



*understand where they are coming from, so you can learn if there is something to learn from it, then most people are quite open with that instead of just going “no, you’re wrong”. Yeah so it depends what approach you take.”*

Other midwives did not question the medical officer’s orders however, due to the Medical Dominance within the maternity unit and the historical protocol of having to follow ‘doctor’s orders’. This can be seen in the following data segment:

*Julliette: they’re [medical officers] calling every shot. If they [medical officers] deem that you do a CTG..... then you have to do it. .*

This data segment confirmed the experiences this researcher experienced during her own midwifery experience, in which midwives were seen to be complying with medical officer’s preferences with no consideration for the labouring woman’s preferences or evidence based practice recommendations. Some midwives responded to the medical officer’s expectations of routine CTG usage by implementing CEFM as a matter of routine when that particular medical officer was rostered on. This appeared to be to save time or to prove efficiency when the midwife updated the medical officer about the activity level of birth suite. It seemed that these midwives were seeking the approval and acceptance of their ‘dominant’ colleagues. Other midwives however would challenge routine practices that were incongruent with evidence based practice guidelines and this was also found in the interview data as discussed.

Drawing from the data, it appears that in this Queensland setting, the midwives’ decision-making about CEFM is broadly influenced by Medical Dominance. This condition is closely linked to the condition of Risk Management, due to the strong link between medical actions and the philosophy of medicine that is underpinned by a risk avoidance approach. A strong linkage to the Trust in Others category also exists with data demonstrating a lack of trust between medical and the midwifery staff.

**Structure of the Decision-making Environment in Summary**

Both of the contextual conditions, Risk Management and Medical Dominance, were linked broadly to midwives' decision-making and CEFM. How trust was woven throughout these conditions has been introduced and will be further discussed within the decision-making processes. The structure created by these contextual factors is the setting in which the midwives' decision-making occurs. The linkage between structure and process has been outlined by describing how each condition is interlinked with other conditions as well as with categories within the decision-making process. The processes of decision-making will now be examined further.

**DECISION-MAKING PROCESSES**

The decision-making process within the paradigm consists of a sequence of events including actions, interactions, interruptions and consequences. The decision-making process is inclusive of what has already been presented in this chapter as the midwives' decision-making pathway. The decision-making process is a dynamic process that evolves over time, from the initial meeting between the birthing woman and midwife and includes interactions with the other staff and circumstances surrounding midwives' decision-making. Actions of the midwife, woman and of other staff are integral to the process. The interactions and actions can be interrupted by other phenomena, such as workloads and finally, the consequences of the method of foetal monitoring chosen draws the sequence to the end point of the decision-making process.

Diagrammatic representations of the decision-making pathway will be used to demonstrate the influences on the decision-making process. This 'step by step' diagrammatic approach will demonstrate how categories and sub categories from the

data link together to culminate into the decision-making paradigm as a whole (seen in Figure 4.2: Midwives' CEFM Decision-Making, Despite EBCPG, page 95). The findings from the research of this complex process will be outlined in a sequential manner. Firstly, the actions will be described and supported with data. Interactions of the five dimensions of trust with the actions will then be described, followed by potential interruptions to the decision-making process. Finally, the consequences of the midwives' decision-making will be outlined.

The following diagram represents the decision-making process (Figure 4.3).

**Figure 4.3: Decision-Making Process**

Actions	Interactions	Interruptions	Consequences
<ul style="list-style-type: none"> <li>◆ Gathering Baseline Information</li> <li>◆ Deciding to do a baseline CTG</li> <li>◆ Undertaking Individualised Assessment</li> <li>◆ Categorising according to risk</li> <li>◆ Deciding to use CEFM</li> </ul>	<ul style="list-style-type: none"> <li>◆ Trust In:                             <ul style="list-style-type: none"> <li>○ Policy</li> <li>○ Woman</li> <li>○ CTG Technology</li> <li>○ Clinical Judgement</li> <li>○ Others</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>◆ Workloads</li> </ul>	<ul style="list-style-type: none"> <li>◆ Low Risk Woman monitored with CEFM                             <ul style="list-style-type: none"> <li>○ Limited Choices for Women</li> <li>○ More interventions during labour</li> <li>○ Woman feels reassured by CTG technology</li> <li>○ Midwives feel in control of workloads</li> <li>○ Midwives feel safe</li> </ul> </li> </ul>

**Actions**

The Actions identified from the data represent the midwives' activities during the decision-making process. This includes Gathering Baseline Information, Deciding to do a Baseline CTG, Undertaking Individualised Assessment, Categorising According to Risk and Deciding to Use CEFM. Each of these categories will now be explained.

**Gathering Baseline Information**

The decision-making process begins with the midwife gathering assessment data about the woman on her admission to Birth Suite or when the midwife is taking over from another midwife during staff changeovers. This process of gathering baseline information was described by all of the midwives. It may include reading the medical record or talking with the woman and listening to her story. It also involved taking vital signs such as blood pressure, doing an abdominal palpation to identify foetal position and descent and listening to the rate and rhythm of the foetal heartbeat, as reflected in the following data segments:

*Juliette: With a woman in labour, first of all I look at her history. So, what kind of history has she got? Has this lady had a previous foetal distress? Has this lady had previous uterine surgery? ...quickly get a history, verbally or reading it... and you do a physical examination and you look at her*

*Amber: we'd just listen to the foetal heart for about a minute, do a set of obs [observations] and a palp [abdominal palpation] and those sorts of things'*

The midwives talked about gathering a lot of information during the first meeting in birth suite with the labouring woman and demonstrated an advanced level of observation during this phase, which is demonstrated within Dorothy's comments:

*Dorothy: I think in that 20 minutes or the first few minutes even when someone arrives in the room, you do a lot of observation you are not aware of, you've very quickly made up your mind whether someone is in established labour, they're needing urgent pain relief, um whether they are very anxious. You establish quite a lot in the first few minutes*

To determine foetal well-being, some midwives asked the woman about foetal movements whilst others used a baseline CTG trace. There was very little evidence of the midwives involving the labouring woman in the decision-making process about the use of the CTG.

### **Deciding to do a Baseline CTG**

Deciding to do a Baseline CTG was identified as the first decision-making opportunity for midwives regarding the use of the CTG (See Key Point 1 in Figure 4.1: Midwives' Decision-Making Pathway and Factors Influencing the Use of the CTG on Low Risk Labouring Women, Page 101). The category Deciding to do a Baseline CTG was identified from within the data from segments including:

*Dorothy: I still hold with doing the baseline recording when a woman is admitted in labour, it gives you something to look at and see how that baby coped in the early stages [of labour]*

This data segment demonstrates how Dorothy values having something to 'look at' compared to just listening to the foetal heart rate. The next data segment demonstrates how Iris does a baseline CTG as a matter of routine, comparing it to doing a blood pressure.

*Iris: I always do a baseline CTG, just like the vital statistics, I think it's the best use of it, you know.....when any woman is admitted to the birth suite for what ever reason pertaining to her labour..... I just do their vital signs, I do a urine test and a baseline CTG.*

These data segments demonstrate the midwives action of Deciding to Use a Baseline CTG. It can be seen that Dorothy and Iris decided to use a CTG on all labouring women. The factors contributing to this decision were also discussed within the structure of the decision-making environment and will be discussed further within the interaction processes. Deciding to do a Baseline CTG is closely linked to Risk

Management, Medical Dominance, Trusting in CTG Technology and Trusting in Others.

Once the midwives had all the initial baseline information about the woman in labour, they then completed an individualised assessment of the overall condition of the woman, foetus and her labouring condition. During this period the midwives reached a second decision-making opportunity regarding the use of the CTG (See Key Point Two in Figure 4.1: Midwives' Decision-Making Pathway and Factors Influencing the Use of the CTG on Low Risk Labouring Women, Page 101).

### **Undertaking Individualised Assessment**

Undertaking an Individualised Assessment represents the action of the midwives as they analysed the baseline information to make an individualized assessment specific to the labouring woman in their care. The individualised assessment can be seen in the following data segments:

*Dorothy: If all was well there, and Mum was low risk, hadn't had any pregnancy complication and I was happy in that respect, I would discontinue the CTG and just do IA with a Doppler.*

*Iris: the patient I had was getting some type 1 decelerations ... and she was transitional, in myself I knew she was transitional so I was not at all concerned.*

*Juliette: you've just got to look at the lady, look at her.... See what you think...*

These data segments demonstrate the midwives processing the information they had collected and coming to some conclusions about the information during the process of Undertaking Individualised Assessment. The midwives' actions were impacted by various factors, consequently there is a strong link between this category and other categories including: Trusting in Own Clinical Judgement, Trusting in CTG Technology, Trusting in Policy and Trusting in Others.

Once the midwives completed the Individualised Assessment they decided the best manner in which to monitor the well-being of the labouring woman and foetus according to their own personal clinical risk schema.

### **Categorising according to the Midwife's Judgement of Risk**

The action titled Categorising according to the Midwife's Judgement of Risk represents the midwives identifying the labouring woman as low risk and high risk, according to the midwives' own risk schema. The woman that the midwife identified as being low risk would be monitored with IA. The woman categorised as high risk may be monitored with IA or CEFM. The criteria for categorising were not necessarily congruent with EBCPG. The following data segments demonstrate some examples of when CEFM would be used on labouring women.

*Caitlyn: well obviously we've got all of our particular protocols you know, post dates, mec liq..... That's when we do put them on [the CTG]*

*Julliette: we all like to monitor our little prems [preterm foetus]*

*Iris: I just knew straight away that this was not going to progress well, I couldn't put my finger on why, but you just had that feeling, that's not evidence or anything, its just a feeling. Maybe if I'd thought about it more it probably wasn't intuition its probably other clinical signs that I was getting, but I didn't realise that I was getting... like this was a really young girl, she had no antenatal care at all. I'm just thinking back no, you know other stuff which made me suspicious of her pregnancy anyway,..... so that's probably why I had the little alarm bells ringing*

*Amber: you can see that she wasn't sure if she had ruptured her membranes or not, so we wanted to make sure that had actually happened, that baby was OK, that perhaps there was some cord presentation or compression*

These data demonstrate that preterm labour, rupture of membranes and 'just had that feeling' would deem the woman as high risk and requiring CEFM. According to the EBCPG, only preterm labour would be considered a high risk pregnancy requiring

CEFM (RCOG, 2001). The midwives did however all indicate that if the labouring woman was low risk according to their clinical judgement they would use IA. In the following data segment Dorothy expresses this view. Dorothy does mention, however, that she would do an admission CTG prior to deciding if the woman was low risk.

*Dorothy: If all was well there, and Mum was low risk, hadn't had any pregnancy complication and I was happy in that respect I would discontinue the CTG and just do intermittent auscultation with a Doppler*

This categorising action of the midwives led to the final action of Deciding to Use CEFM. This action will now be described.

### **Deciding to Use CEFM**

The action Deciding to Use CEFM represents the activity of monitoring the low risk labouring woman by using CEFM. This data was evidenced both from interview data and also from the medical records themselves, prior to the unstructured interviews with the midwives. As stated in Chapter Three, each of the midwife interviews took place following a chart audit identifying a low risk labouring woman being monitored with CEFM during labour (see Table 3.1: The Participants, page 124). The information obtained from the medical record also formed part of the primary data. This is evidenced within the following research memo.

#### *Why CEFM?*

*Iris was helping out in a busy labour ward. A CTG was put on for a baseline recording on a low risk labouring woman then another midwife took over care and CEFM continued. Perhaps this midwife trusted Iris's clinical judgement and that Iris must have put the CEFM for a reason so left it on OR maybe she was too busy and didn't ever get around to following up and taking it off.*

*Dorothy used a CTG trace as part of the admission process on a low risk labouring woman, busy shift – wasn't taken off – CEFM as babysitter.*

*Julliette thought there was something 'not quite right' with her lady on admission and therefore used CEFM. According to guidelines on admission the women met low risk criteria and therefore didn't warrant CEFM. Later,*



*however, the woman became febrile and it was discovered the woman had a UTI and antibiotics were commenced during labour.*

*Julliette used CEFM because of being suspicious; her clinical judgment. Perhaps what Julliette was 'getting' was the UTI [urinary tract infection] that was later diagnosed.*

*Amber and Caitlyn monitored the women because of possible rupture of membranes during early labour. Both women were low risk according to evidence based guidelines. Applying CEFM on admission was an efficient way of working because it would save them time later if the women were able to return home. Doctors generally expected that a CTG trace should be attended prior to sending a woman home in early labour. When the women didn't get sent home however the CTG stayed on and they ended up with labour + CEFM.*

*With 4 out of 5 of these women, CEFM resulted from baseline CTGs being put on. A major factor to them staying on was staff workloads.*

**Source:** Research Memo (not dated)

This memo gives evidence to the action of Deciding to Use CEFM on low risk labouring women. Data segments also demonstrated the action of monitoring labouring woman with CEFM, such as:

*Iris: If I have to have a CTG on for hours, it would be because there was something I was suspicious about.*

*Amber: occasionally you see it being used for ease of monitoring particularly when it's busy*

These data also give evidence of midwives Deciding to Use CEFM.

### **Summary of Actions**

The Actions consisted of Gathering Baseline Information, Deciding to do a Baseline CTG, Undertaking Individualised Assessment, Categorising According to the Midwives Judgement of Risk and Deciding to Use CEFM, represent the activities undertaken by the midwives during the decision-making process. Other factors however, influenced these actions. This will now be detailed within the interactions and interruptions sections.

**Interactions**

The interactions were identified from the data and largely represent the thinking processes of the midwives during the discussions and contact with the labouring woman, other midwives and medical staff and the midwives own beliefs and previous experiences. This researcher was surprised to find little involvement of the labouring woman in the decision-making processes, however, it was discovered that the inaction of most labouring women contributed to the midwives' decision-making processes by their acceptance, or lack of resistance to the use of CEFM during their labour. This is discussed further in Trust in Others and Trust in CTG Technology. The midwives' thinking processes interacted in a way that influenced the actions and decisions they made about using CEFM. Trust levels that the midwife held profoundly influenced the midwives' cognitions. The core category of Trust will be defined and broken down into five dimensions to demonstrate the major impact Trust was found to have on midwives' decision-making and CEFM.

**The Core Category: Trust**

The category of Trust represents a faith, value and /or confidence in an entity or person that influenced the midwives clinical decision-making regarding CEFM. Trust emerged as the core category through continuous questioning of the data and testing the researcher's hunches against the data. Revisiting research memos and presenting ideas to colleagues for discussion also contributed to clarifying the core category. Five dimensions of Trust emerged from the data, *Trust in Policy*; *Trust in Clinical Judgement*, *Trust in 'Woman'*, *Trust in CTG Technology*, *Trust in Others*. Each of the dimensions of trust will be explained separately in relation to how they relate to the midwives' cognitions and interact with the decision-making processes.

*Trusting in Policy*

Trusting in Policy encompasses the level of trust clinicians demonstrated in policy, that is: a local guideline or plan of action that is developed to direct the practice of clinicians working within the workplace setting. This category was closely linked to the categories of Trust in Woman and Risk Management and was also impacted by Workloads.

Differences among the midwives were reflected in their levels of trust in policy. The midwives with less experience emphasised their trust in policy and the importance of following policy during the decision-making process. Kaitlyn expresses her opinion about the importance of policy in the following data segment:

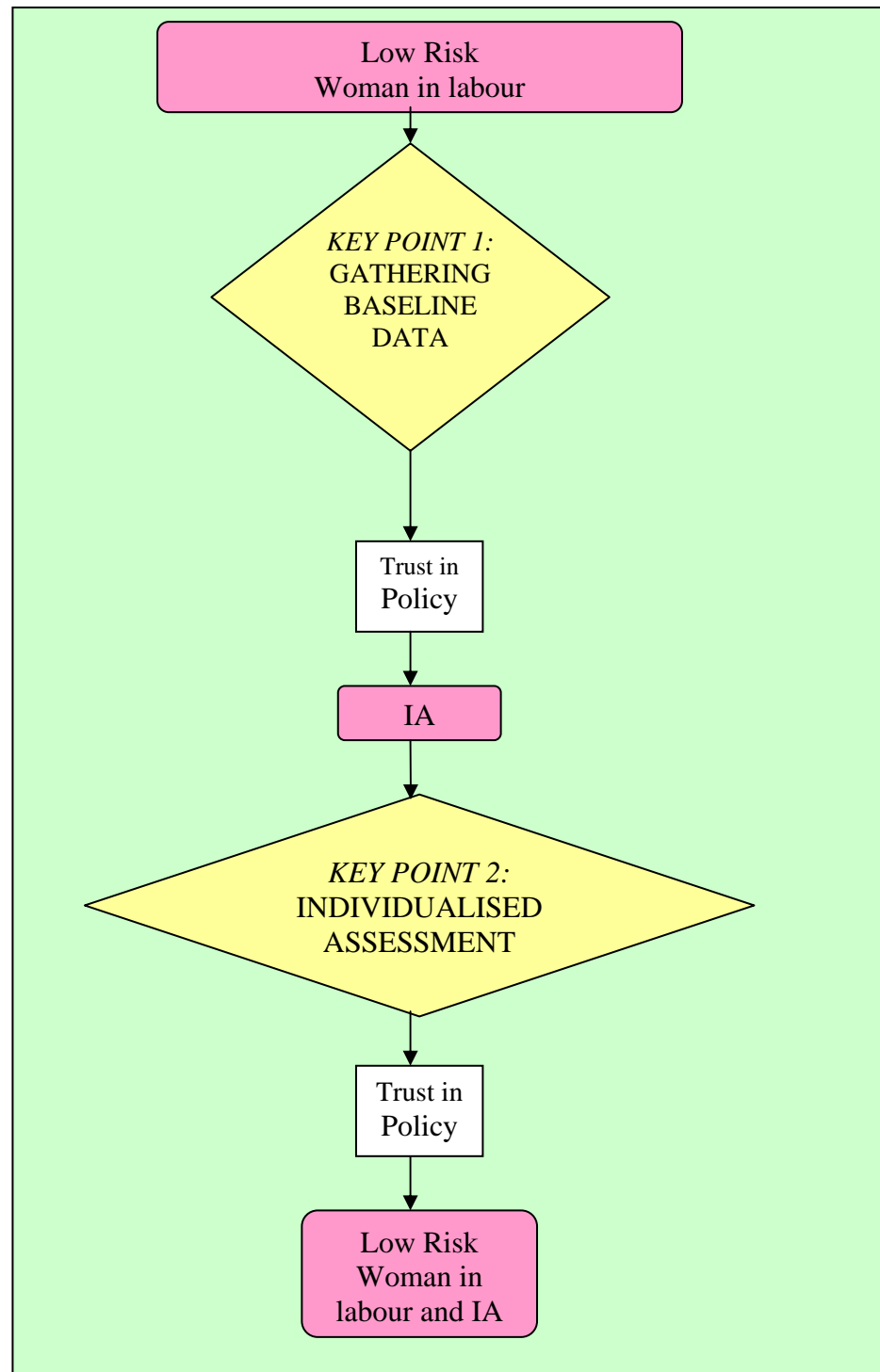
*Kaitlyn: because of the policy, that's why we act like we act and why we don't do things.*

Amber's statement also infers the importance of policy:

*Amber: when I was coming on shift and there was a quick hand over and I'd find a woman on a CTG, I'd think 'Why is she on a CTG?' So I'd have a read through her chart and then compare it with the policy. I found that useful. The more you get used to it [policy], the more you get your head around it. They [policies] are good to have as a baseline, something to refer back to and refer others to as well.*

From the interview data, the decisions about CEFM by the two midwives with less experience demonstrated a close link to Trust in Policy. This dimension of Trust was dominant for the less experienced midwives at both key points during decision-making about using CEFM on low risk labouring women (Figure 4.4). Figure 4.4 demonstrates how the less experienced midwives cognitions' interacted with their decisions to follow policy, thereby using IA at key point one and key point two.

**Figure 4.4: Less Experienced Midwives' Decision-Making Process -  
Using the CTG on Low Risk Labouring Women**



When the medical record data was examined however, both of these midwives did use CEFM on a low risk labouring woman. The hospital policy and current clinical practice guidelines do not support the use of a baseline CTG or the use of CEFM on a labouring woman with possible rupture of membranes, unless the membranes have been ruptured for greater than eighteen hours (RCOG, 2001). Both the less experienced midwives discussed the importance of following this policy, yet acted in a manner that was incongruent with written hospital policy. How their decisions were impacted upon by Workloads will be discussed later in the chapter.

Conversely, midwives with more experience were aware of, and paid attention to policy within hospital settings; however, policy was not considered as important as their trust in their own clinical judgement. This is illustrated in the following quote:

*Iris: it [policy] governs you when you are unsure of yourself, once you're finding yourself more confident you find yourself not really 'sticking to that program', it's what the woman wants while you feel that it's safe and comfortable.*

Trust in policy did not dominate the experienced midwives' cognitions during decision-making, yet was found to be the dominant focus of the less experienced midwives in their decision-making process, even though in certain circumstances their dominant focus was interrupted (as will be discussed in the interruptions section).

#### *Trusting in CTG Technology*

Trusting in CTG technology represents the value health professionals hold in CTG technology and the data it delivers about foetal well-being and included sub-categories such as Staff trusting CTG, Baseline CTG, Women trusting CTG. This category was closely linked to the Trust in Others, Workloads and Risk Management categories.

All of the participant midwives had experienced occasions where the CTG had proven effective in identifying a foetus in distress. The midwives also reported mistrust in CTG technology by discussing cases where the CTG trace had been concerning and resulted in emergency actions, yet clinical outcomes did not confirm the concern, suggesting unnecessary intervention. In the following quotes, Kaitlyn and Dorothy express confusion about the incongruence of a non-reassuring CTG trace and clinical outcomes and also the relief that is felt when positive outcomes result from the CTG alerting staff to foetal distress.

*Dorothy: sometimes you review CTGs and they look dreadful and you get a nice screaming baby at the end of it and other times you put them on [CTG traces] and they look very reassuring and out comes a baby who needs a fair old bit of resuscitation*

*Kaitlyn: ... you have a dodgy CTG and they go to theatre [for an emergency delivery] and they [mother and baby] are absolutely fine. Whereas on the other hand, you do see it the other way as well - you think 'Thank goodness we did have a CTG'.*

These data were representative of all of the midwives interviewed. The comment demonstrates how past positive experiences relating to the use of the CTG offers both midwives and families an opportunity to develop a sense of trust in the CTG technology balanced with the risk of unnecessary intervention.

Previous experiences were found to influence the more experienced midwives. These midwives chose to do a baseline CTG at key point one (Figure 4.1) on all women in labour as a precautionary measure. The information gathered from the baseline CTG trace is combined with other routine assessment data, to make an individualised assessment and decide (at key point two, Figure 4.1) whether CEFM or IA will be used

during the labour. In the following data segment Iris demonstrates using the CTG as a baseline.

*Iris: I'll do that [CTG trace] and if it's fine and the woman is in early established labour then I'll take it off and let her do her own thing basically*

This decision demonstrates the underlying trust in CTG technology of the more experienced midwives.

Interactions between the midwives and the labouring women regarding the use of the CTG also reflected high levels of trust from the women in CTG technology. The midwives expressed a view that women expect technical equipment to be used during hospitalisation and that women feel interested and reassured by the use of CEFM. For example:

*Iris: From what I've seen they [women in labour] expect that the baby is going to be monitored and that's how we do it and they don't question.*

*Julliette: they don't mind being monitored, it's really quiet reassuring for them.*

*Dorothy: I think they are usually quite interested, ..... I have always found them to be quite interested you know, they don't get overly concerned about it.*

Only one midwife discussed a woman questioning the use of CEFM. This woman was described as being different to most other women in her approach to childbirth, as is demonstrated in the following data segment.

*Kaitlyn: she [woman questioning options] was extremely well researched and widely read and was in every single group going for natural childbirth.*

Generally, however, women accepted and expected to be monitored with a CTG during labour. This reflects the level of trust women were perceived to have in use of technology within the health environment.

The two midwives with less experience did not appear to hold this level of trust in CTG technology and did not believe the CTG provided more accurate information than they could ascertain by thorough assessment without the CTG. For example:

*Kaitlyn: I know sometimes you put a CTG on and for no reason in particular its not a very good CTG, those are the times when you think “well its good we did do this” but if they’ve [labouring women] had no pain, no bleeding, good foetal movements and clear liquor and everything in the pregnancy has been fine, then if you listened to the foetal heart and it sounded good through a contraction then I would feel quite confident of the foetal well-being really.*

This example demonstrates Kaitlyn’s view that assessment can be comprehensive without CTG technology, a view that is congruent with current clinical practice guidelines.

Trusting in CTG technology influenced the more experienced midwives particularly at key point one (Figure 4.1). The less experienced midwives were not dominated by this level of trust. All of the midwives believed that most women demonstrated a general trust in CTG technology. Trust in CTG technology influenced interactions and actions during the decision-making process.

#### *Trusting in Others*

Trusting in Others was core to the decision-making process regarding the use of CEFM on low risk labouring women and encompasses trust between staff members working in birth suite. This category included Trust between Staff and Trusting Health Professionals. This category was closely linked to the Trust in Woman and Trust in CTG Technology, Risk Management and Medical Dominance categories.

The trust that exists between birth suite staff members caring for labouring women was found to influence decision-making interaction and actions and increase the rate of CTG



usage at key points one and two in the decision-making process (Figure 4.6). For example, if a health professional was working with an unknown colleague or they lacked confidence in colleagues' clinical skills; it was more likely that the woman would be placed on CEFM. Using CEFM enables the other clinician to visually check their colleagues' assessment in a discrete manner by looking at the CTG trace, rather than trusting in their colleague's IA assessment skills. It can be seen also at this point, how this category links closely with Trust in CTG Technology, with the colleague midwife trusting more so in the CTG, than the unknown midwife. The following data segment demonstrates this concept:

*Dorothy: I think it's a trust thing really you know, there's so many staff and they don't know how experienced you are, so I think that if they can just pop in and look at the CTG they feel happier.*

This is more likely to happen when staff are working together for the first time or they are unknown to one another. The following verbatim quote demonstrates a newly employed, experienced midwife, being questioned by an existing midwife member of staff.

*Dorothy: I remember the 1st shift I did in the birth suite a few weeks ago, and I'd just started there and the midwife didn't know me, she wasn't sure of what my level of experience was... the patient I had was getting some type 1 decelerations.... and she was transitional. In myself I knew she was transitional, so I was not at all concerned, whereas she [other midwife] came in and because she didn't know me she said "Is this right? Is this right? What about this?"*

This also happens frequently when new medical officers commence and don't know any of the birth suite staff. This can be seen in the following quote when Kaitlyn reflects on the difficulties new medical officers have in getting to know many staff members when they commence duty at the hospital.

*Kaitlyn: it's different with new doctors and for them to sort of gauge everyone's experience and gauge their level of practice and that kinda thing*

Trust levels between staff influences the decision-making about the use of the CTG on low risk labouring women.

It also emerged from the data that most women demonstrated high levels of trust in their midwives. This was particularly evident by the women accepting an intervention such as CEFM with little explanation from the midwife applying it. This data was also linked to the data category Trust in CTG Technology by the level of trust that the midwives perceived the women to have in CTG technology. Data demonstrated that limited information was offered to women prior to a CTG being applied.

*Kaitlyn: I haven't ever heard anyone, never been in the room with a midwife when they were putting a CTG on and they go into everything..... it's just inferred that this is what we do, so that's why we are doing it. That's as much as I've heard other midwives say.....Like I said we don't go into the negatives of having CTG monitoring or anything like that, well I don't and I haven't actually heard anyone else either.*

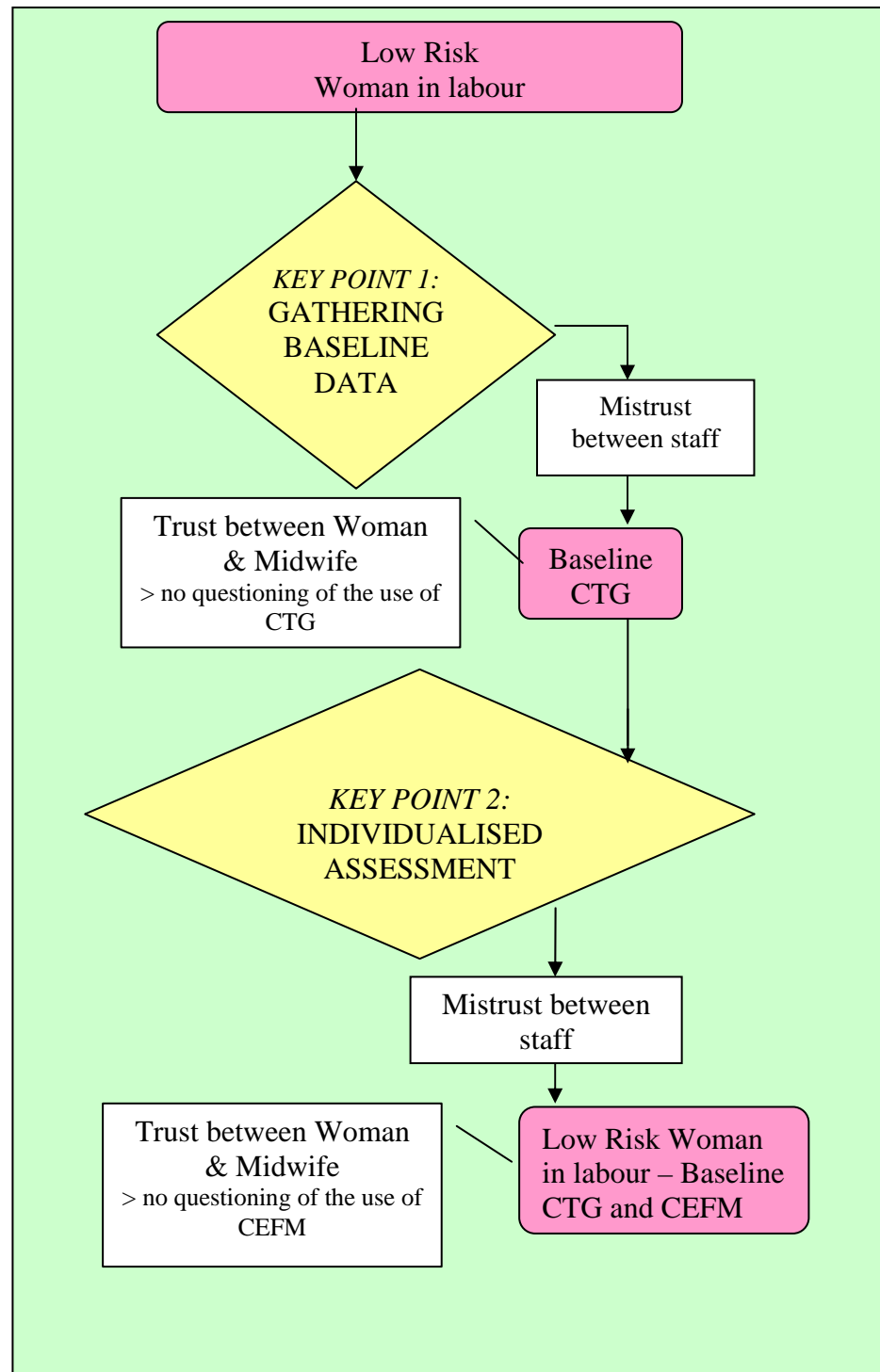
This data segment was representative of four out of the five midwives interviewed. One of the five midwives stated that she shares more extensive information with the client about CTG monitoring, providing she has the time.

*Amber: I tell them what it does, I explain it listens to the heart beat and picks up contractions, I explain the reason we are putting it on, ....and explain that it can restrict movement in labour, ..... and there is a risk of caesar if the heart rate pattern indicates and that doctors are likely to suggest that depending on what happens.*

The evidence that women trust in midwives' decisions without full information indicates women's high trust level in health professionals.

Trusting in Others influences the decision-making about the usage of CTGs at both key points one and two. When mistrust is present between staff members, CEFM is often requested to enable a checking up on the unknown midwife's assessment skills. A trust in professionals on the part of a labouring woman means that there is no questioning or call for justification of the intervention. This is demonstrated in Figure 4.5.

**Figure 4.5: The Effect of Trust in Others on Midwives' Decision-Making:  
Using the CTG on Low Risk Labouring Women**



*Trusting in 'Woman'*

The category termed Trusting in 'Woman' encapsulates a general trust in the ability of 'woman' to nurture her foetus and be insightful regarding the needs of her foetus and self. This category includes subcategories Women Knowing, What the Woman Wants and Involvement in Decision-making. This category was closely linked to the Trust in Others, Trust in CTG Technology and Risk Management categories.

As discussed in Trust in Others, women were given only partial information prior to a CTG being utilised. This offers limited opportunities to women to be involved in decision-making about using a CTG. The following verbatim quote demonstrates how one more experienced midwife actually limits the information shared with the woman prior to utilising CEFM.

*Julliette: .... depending on the midwife, depending on her experience, depending on what she wants to tell the patient. I could go up to you and say 'We just need to check on bub, and see what your contractions are like'. That's probably a fairly standard way, I'd never go up and say 'I'm going to do a CTG because you're a diabetic and you've got a prem baby there and I don't think your placenta's functioning very well'. So you are going to be a real minimalist and you're never going to inform them to your full intent ...."*

Current evidence based clinical guidelines recommend that discussion about CEFM should be open, consultative and in partnership with the woman. The midwife should gain informed choice prior to the application of CEFM (ROCG, 2001; Wickham, 2003). Four out of the five midwives in this study gave guarded information to the women. This did not offer families a true opportunity to be involved in the decision-making process, further suggesting a lack of trust in the ability of 'woman'. In the current climate of midwifery and health care, where models of care focus on 'client centred' approaches and a shared decision-making philosophy, there was, surprisingly, a lack of reference to the woman within the decision-making data.

Excerpt from Research Memo:

*“There is very little mention of ‘the woman’.”*

This highlights a general lack of trust between midwives and ‘woman’.

The two midwives with less experience were noted to express a higher value in the woman’s ability of ‘knowing’ and generally a higher level of trust in ‘woman’ than the more experienced midwives. This was evident in the following data segment:

*Kaitlyn: a case that comes to mind recently was with a Mum whose internal instincts alerted her ‘She just felt that something wasn’t right’ and she came up to birth suite for a CTG and the CTG wasn’t very reassuring..... she went for a caesar and there had been a foetal-maternal transfusion. So that was the maternal instincts.....*

The data revealed that the more experienced midwives had experienced previous incidents where CEFM detected problems of which the woman was unaware and they consequently did not trust that a woman would know if there were problems. All of the midwives, however, displayed a general regard and respect for women by listening to their subjective information and then linking that information to their individualised clinical assessment. In the following quote, Julliette demonstrates this:

*Julliette: The other thing was that she had reported to me that she hadn’t felt the baby moving a lot.*

The midwives also expressed an empathic and protective attitude toward their clients, as can be seen in this data segment:

*Iris: “I just feel that it’s [the foetus] such a precious thing and that if anything went wrong it would be the most devastating thing in the world, ....., and I’m not a Mother myself but I think I just couldn’t bear something to go wrong, I just couldn’t bear it.”*

Data from one of the more experienced midwives indicated a consideration toward women ‘doing their own thing’, but this is secondary to ensuring that the midwife herself felt secure within her decision-making process. For example:

*Iris: ..my biggest concern is to do the baseline one [CTG], if it's busy I'll do that and if it's fine and the woman is in early established labour then I'll take it off and let her do her own thing basically with her support people, I try to keep my hands off as much as possible.*

This demonstrates how the experienced midwife satisfied her own needs of feeling safe and being reassured by doing a CTG at key point one (Figure 4.1), prior to allowing the labouring woman to 'do her own thing'. Iris's decision about foetal monitoring is predominantly directed by the midwife's Trust in CTG Technology, rather than Trust in Woman. This segment also demonstrates the linkage between this category and Risk Management.

In summary, there was a general lack of trust by midwives (particularly those with more midwifery experience) in the notion of 'woman'. All of the midwives displayed a regard and respect for women; however, the process of midwives' decision-making and CEFM was not strongly influenced by this.

#### *Trusting in Clinical Judgement*

Trust in clinical judgement encompasses the midwives' confidence levels in her/his own abilities of clinical assessment and includes sub-categories including Midwives Knowing, Past Experiences, Practicing Autonomously. This category was dominant at key point two for the midwives with more experience.

It emerged from the data, that the midwives gained confidence in their own abilities of clinical assessment over time. Clinical judgement including the midwife's sense of 'knowing' about labour and birth directly impacted on the decision-making of the more experienced midwives in this study. The midwives with more years of experience expressed an ability to make an advanced clinical assessment of a woman in a short

space of time. This is demonstrated in the following data segments where two of the more experienced midwives comment about their ability to quickly assess women.

*Dorothy: the first few minutes even when someone arrives in the room, you do a lot of observation you are not aware of, you've very quickly made up your mind whether someone is in established labour, they're needing urgent pain relief, um whether they are very anxious, you establish quite a lot in the first few minutes...*

*Julliette: the majority of women you can look and you can knowingly nod your head and say "Naah, she's not in labour" or vice versa.*

The midwives spoke about past midwifery experiences and how these experiences built a broader knowledge base to support their clinical judgement. Opportunities of working in environments where higher levels of autonomy existed, also appeared to contribute to their high levels of confidence or trust in their own clinical practice and judgement. Two of the experienced midwives had experiences when CEFM was not available in the workplace, broadening their experiences even more, as demonstrated within these quotes:

*Dorothy: I've worked with home births ...hospital and home births and you don't have that facility [CEFM] available at home so it forces us to look at it in a different way, so I've seen both sides of it*

*Iris: I worked in Africa, I worked in Rwanda, Kenya and Sudan and..... I've also done lots of work in Aboriginal communities, .....  
I must admit I am very used to being very autonomous and coming back into a hospital is a bit of a quantum leap .....*

One of the midwives with less experience spoke of witnessing autonomous midwifery practice and linked autonomy with the level of experience that midwives had, as shown in this following quote.

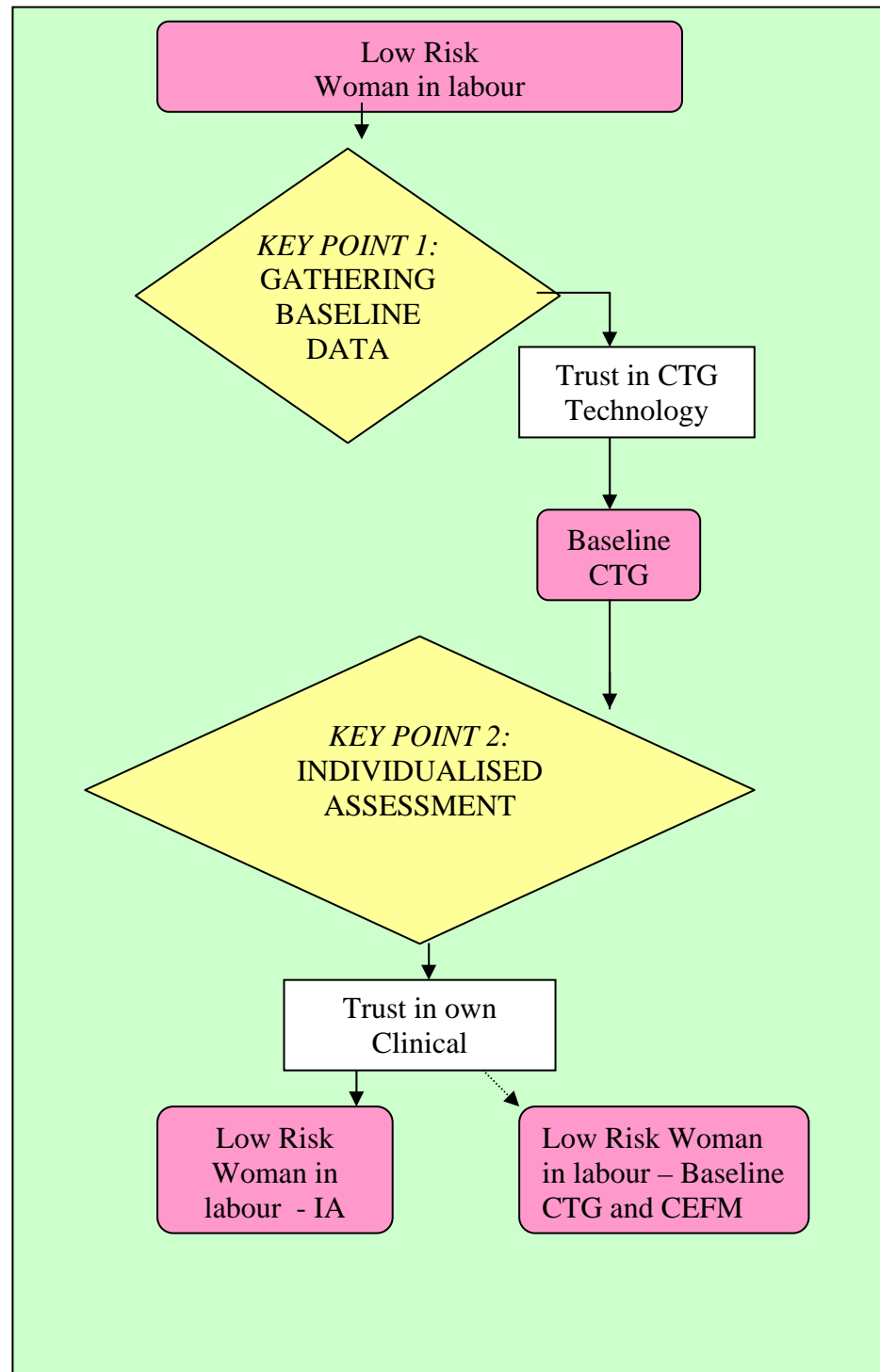
*Kaitlyn: ....its [autonomy] just such an independent thing depending on who the midwife is, and how much experience they've had and things like that ...*

The dimension of Trust in Own Clinical Judgement emerged from many data segments such as these. This dimension of Trust was highly significant for the more experienced midwives as they demonstrated a higher level of autonomy when making decisions (at

key point two) than the less experienced midwives. Experienced midwives were influenced by policy and clinical guidelines, but used their own judgement to make the final decision. At key point one, the experienced midwives are dominated by their Trust in CTG Technology (as discussed earlier) and at key point two, their level of Trust in Clinical Judgement dominates their decision-making process. Figure 4.6 represents the dominant dimensions of trust and the effect on the decision-making process of the experienced midwives.



**Figure 4.6: More Experienced Midwives' Decision-Making Process -  
Using the CTG on Low Risk Labouring Women**



There is a strong influence from the paradigm structure on Trust in Clinical Judgement, particularly with the conditions of Risk Management.

### **‘Interactions’ Summary**

In summary, the midwives’ interactions surrounding their decisions of whether or not to use CEFM changed according to their dominant levels of trust. Generally it was identified that the more experienced midwives’ decision-making was dominated by their trust in CTG technology and clinical judgement and the less experienced midwives, by their trust in policy. Other findings revealed that mistrust between professionals can further influence midwives’ decision-making and that women hold high levels of trust in midwives and CTG technology. The dominant dimensions of trust that exist during the decision-making process impact on the type of foetal monitoring used on low risk labouring women. Other factors titled interruptions can further complicate the decision-making process; these will now be explained and discussed.

### **Interruptions**

Sometimes interruptions, that is a break, delay or interference, may occur and result in a change to the usual sequence within the decision-making pathway. The degree to which these interruptions influence the decision-making process is dependent on the dimension of trust that the midwife holds. The Workloads category was identified as an interruption from the data. This category will be described and explained.

### **Workloads**

The Workloads category refers to the variations in duties and responsibilities of the midwifery workforce providing services for women in the Birth Suites of the hospital.

Decision-making processes were impacted by these variations, causing an interruption that potentially changes the decision-making process. This category was made up of sub-categories labelled as CTG as Babysitter and CTG as Time Filler and had a strong connection to Trust in CTG Technology, Trust in Woman, Trust in Others and Risk Management.

The birth suites are generally staffed at a ratio of one midwife to two labouring women. High workloads may arise when a labouring woman experiences complications, making her care more complex or when more women are in labour than expected or when staff who are on leave are unable to be replaced. It emerged from the data that high workloads potentially increase the rate of CEFM. This is shown in the following quote:

*Dorothy: we may have 3 labouring women to look after at any one time, so I can see for a lot of people it's a good idea 'Oh, I'll just leave that [CTG machine] on' and then they can flit in and out to different women.*

High workloads during shifts influence the manner in which midwives use the CTG, depending on the midwife's level of trust. If the midwife has a high trust level in CTG technology, the midwife may attempt to reduce the workload or manage her time effectively by using the CTG as a 'babysitter' to assist in ongoing assessment of the woman and foetus. The midwife may briefly assess a woman and then use the CTG to collect additional information about the foetal well-being or the contraction pattern whilst she returns to care for other women. Whilst the midwife is away, the midwife feels as though something is being done for the woman and that the woman is 'attended to' in the absence of staff.

*Dorothy: when I'm busy of course I feel that it's observing a woman when I can't....*

Some midwives anticipate that it is quicker to just 'look at' the CTG compared to IA, which involves palpating the abdomen to identify the foetal position, finding the foetal

heart and then listening to the rate and rhythm. In addition to this, if the midwife is too busy to visually assess the client and CTG, the CTG volume can be set loud enough so that the foetal heart sounds can be heard from outside of the room. This means the midwife does not even need to enter the room to be reassured of foetal wellbeing. This concept of 'remote monitoring' is further demonstrated by this verbatim quote:

*Juliette: because of the ease, because we are so darn busy that we like to do it [CTG], or it's reassuring to us to hear that 'thump, thump, thump while we're not in the room..... I know one particular member, she's not here now, but she used to nearly deafen us of a night time - she used to turn it [CTG] up so loud because she could hear that .... she could hear that all the time while she was doing other work.*

This demonstrates how midwives that hold a high level of trust in CTG technology, use CEFM in an attempt to control workload issues within the clinical environment. The concept is also demonstrated in the following data segments:

*Iris: "I guess it's part of my management of my environment, maybe it's a part of nursing I don't know, but you have to have a sense of control..... I might have this woman coming in and I might have two other women to care for and it just feels safe that I'm doing everything for a woman who might be coming in and out with something that may not be critical." ... "I am fully aware of the events that have happened but I am still in control of it."*

*Dorothy: I think as well we use CTGs in a babysitting mode because it allows us to do other parts of you workload while we are keeping an eye on something'*

All of the midwives reported either using the CTG or having witnessed the CTG being used as a 'babysitter' during busy shifts. Often the midwife does not have the time to carry out an individualised assessment during key point two and if a baseline CTG was used at key point one, the woman receives CEFM during labour.

The two less experienced midwives did not use the CTG as a 'babysitter' as they were directed by their dominant trust in policy, which does not recommend the CTG being used on low risk women. The less experienced midwives also had a higher level of Trust in Woman (as discussed previously) than Trust in CTG Technology, indicating

that they would trust in the women to communicate effectively about their well-being, rather than using the CTG.

During high workloads, some of the midwives also discussed using the CTG as a ‘time filler’. It was identified during medical record audits (as part of the data collection process) that the two less experienced midwives used the CTG in this manner regardless of their Trust in Policy, as a time saving strategy for themselves and the woman. The following scenario describes this.

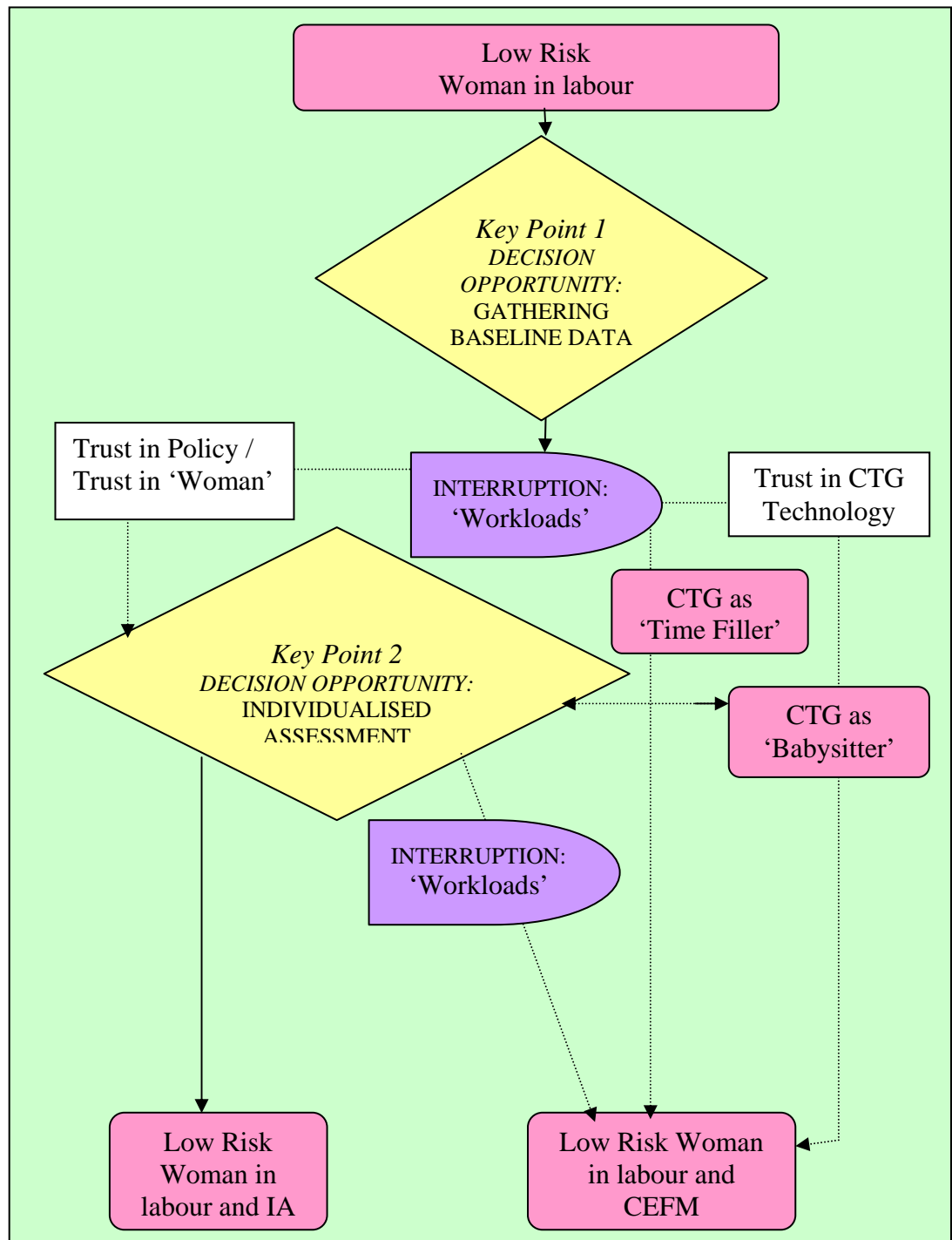
A woman presented in early labour with possible rupture of membranes, according to written policy a speculum examination is performed. The woman is required to lie down for approximately twenty minutes to allow liquor to pool in the vagina prior to the speculum examination. If the membranes were ruptured, the woman was likely to stay in hospital. In the event that the membranes are not ruptured, the woman may be able to return home, but would usually have a CTG trace prior to leaving. Therefore the midwives used to CTG opportunistically while the woman was waiting for the speculum examination. This is demonstrated in the following data segment:

*Kaitlyn: its like a ‘time filler’ you get them to lie down for 20 minutes so lets just stick a CTG on them, they’re not doing anything else.*

Consequently, time efficiency led staff to apply the CTG as a ‘time filler’ which potentially saved time for both the woman and the midwife, in the event that the woman was able to return home. Again in this scenario (as was seen in the medical records data) if Workloads remained high, the midwife may not get the time to individually assess the woman at key point two and the woman may remain to be monitored during labour with CEFM.

These examples demonstrate that high workloads can interrupt the decision-making process of the midwives, increasing the likelihood of a low risk woman being unnecessarily monitored during labour. These findings are summarised in Figure 4.7.

**Figure 4.7: Decision-Making Pathway and Interruptions**



The results demonstrate that Workloads impact on midwives' decision-making by increasing rates of CEFM on low risk labouring women. The final part of the decision-making process relates to the consequences of the midwives' decision-making.

### **Consequences**

The general outcome of the decision-making process is that low risk women are monitored by IA alone, CEFM and IA or CEFM alone. If the woman is monitored by IA alone, this means that the foetal heart is auscultated approximately every 30 minutes during established labour, usually with a hand held device called a Doppler. The woman has complete freedom of movement and any choice of comfort measures, including massage, hot packs or the use of water therapies. On the other hand, if the decision outcome is that of CEFM alone, the woman is commonly encouraged to remain on the bed, in a semi-recumbent position with the CTG transducers and straps around her abdomen. It is difficult to move around freely whilst maintaining an effective trace of the foetal heart and her position and the CTG apparatus limits massage. It is not possible to use water therapies whilst being monitored with CEFM. If a combination of IA and CEFM are used, the woman is able to alternate her comfort measures according to the type of monitoring being used. Analysis of the data in this study has uncovered the following consequences categorised as Consequences for Women and Consequences for Midwives (Table 4.1).

**Table 4.1: Consequences for Women and Consequences for Midwives**

<i>Consequences for Women</i>	<i>Consequences for Midwives</i>
More interventions Limited choices Feeling reassured	Feeling Safe Feeling in Control

These categories will be now discussed.

### **Consequences for Women**

The category Consequences for Women, encapsulates how the different forms of foetal monitoring affected women according to the data and included sub-categories Limited Choices, More Interventions and Feeling Reassured.

#### *Limited Choices*

One outcome identified from the data was limited choices for labouring women. The following quote from Kaitlyn shows how some women view CEFM as limiting whilst others, didn't seem to mind CEFM being used:

*Kaitlyn: Well you get both types of women, you get ones who really value their mobility in labour..... The last thing they want is for you to go ahead and do whatever and then they say "Oh, I didn't know I'd be stuck on the bed". So, you know those women who want to get up and walk and have a shower and a bath, they are not really keen on it [CTG]. But other women, especially those women who've had a baby on the bed before, you know, they haven't thought of mobility as being a big part of getting the labour progress going, they don't seem to mind as much.*

This data segment demonstrates one consequence for women relating to foetal monitoring. Some women value being mobile and active in labour, therefore IA would facilitate this freedom for women; the woman can walk, shower or bath as she wishes, however CEFM would significantly limit the woman's choices. The data segment also demonstrates how some women are content to stay on the bed in labour. CEFM may not be, as limiting to these women's choices, however would still limit the full range of comfort measures being used. Dorothy voiced similar concepts in the following data segment:

*Dorothy: for the woman it's not necessarily the best thing. She may then feel confined to bed, simply because that is how we often put it on, and if you don't make a point of getting them out to help them move around or to sit on a chair or whatever, they feel very much confined 'they've got to stay there' which doesn't always help with their labour.*

As did Julliette:



*Julliette: “I think the biggest drawback to it [CEFM], is that our ladies are immobilised, they are stuck on that damn bed and they can’t go anywhere. You look at how many of them, 12 hours later that are still sitting on that bed, they must have the numbest bums.”*

These data segments represent how the data demonstrates the limiting effect CEFM has on labouring women.

#### *More Interventions*

Data also demonstrated the potential for CEFM to lead to higher rates of medical interventions during labour. For example:

*Julliette: these women [women being monitored by CEFM] tend to hit the bed, I try to move them into a seat and yes we do some [CTGs] in the chairs and that, but what they [labouring women] tend to do is get epidurals fairly quickly, then of course once you’ve got an epidural, well you’ve got to have it [CEFM], or if you’ve got syntocinon. How many of these ladies are augmented? ..... And I find that because they get epidurals fairly early they are constantly monitored from that time any way. So there are really not many choices for the women.*

Julliette discusses how women with CEFM end up with epidurals sooner because they are limited with their choices of comfort measures; furthermore, following the epidural, another common intervention is likely to occur - the use of a drug (Syntocinon) to enhance the contractions.

#### *Feeling Reassured*

Conversely, the data demonstrated that a consequence for some women was ‘feeling reassured’ by CEFM. This is seen in the following data segment.

*Julliette: they don’t mind being monitored, it’s really quiet reassuring for them.*

The midwives discussed how some women found CEFM reassuring to them about the well-being of their baby. There is a strong linkage between this category and Trust in CTG Technology.

---

**Summary – Consequences for Women**

The data demonstrated several outcomes for women as a consequence to foetal monitoring decision-making. CEFM resulted in limited choices and more interventions for women in labour, yet was also found to be reassuring for some women. Decision-making also resulted in consequences for midwives.

**Consequences for Midwives**

Consequences for midwives encapsulate the outcomes of using the different forms of foetal monitoring, such as Feeling Safe, Feeling in Control. Each of these will be described and explained.

**Feeling in Control**

As demonstrated within earlier data segments, midwives' workloads are often very demanding. The data indicated that one way midwives adapt to their busy workloads in birth suite is by implementing the use of CEFM so that the foetal heart rate can be heard outside of the room whilst the midwife is doing other things. Midwives were also reassured that the CTG would alarm if any thing was wrong and it could monitor the baby when they were too busy. Using strategies such as these resulted in staff feeling a 'sense of control' over demanding workloads and midwives feeling safe. This is evidenced in the following quotations:

Dorothy: *I am fully aware of the events that have happened but I am still in control of it.*

Iris: *when I'm busy of course I feel that it's observing a woman when I can't....*  
And

Julliette: *she [the midwife] could hear that [foetal heart] all the time while she was doing other work. She was very good at time management, but it was mainly because she could hear that baby from where ever she was.*

A consequence of the midwife's decision-making to use CEFM during busy times resulted in the midwife feeling in control in what may be a chaotic environment.

### **Feeling Safe**

Feeling Safe was another consequence of CEFM for the midwife. All midwives had had experiences or heard of experiences where there were no risk factors evident; yet, when the CTG was used to monitor the foetus it was revealed that there was 'foetal distress'. For some midwives, particularly those who had experienced adverse events, the CTG reassured the midwife that she wasn't missing anything. For example:

*Iris: the fact that I've done that CTG it makes me feel safe, that I've really looked at her properly.*

And

*Dorothy: so I think that if they can just pop in and look at the CTG they feel happier.*

Midwives who practice in this way may believe they are minimising risk (linkage to Risk Management and Trust in CTG Technology) and consequently feel safe. The midwives may also feel that this will keep them safe from being traumatised or 'getting into trouble' or any disciplinary action if an adverse event occurs. This can be seen in the following data segment.

*Iris: I guess I feel that if I do my job properly then I won't get into trouble, I mean it's a silly way of saying it...if I do everything properly, I monitor them closely, I give them all my time and then if something did go wrong, well then, what happens, happens - from time to time... you see that, I've seen it happen in different places and I've seen it happen before, and it just happens, you can't do much about it.*

### *Summary – Consequences for Midwives*

The data demonstrated several outcomes for midwives as a result of CEFM being used on low risk labouring women. The midwives felt safer and more in control of their workloads when CEFM was being used.

**Consequences - Summary**

The consequences of decision-making outcomes have been shown to have positive effects for midwives, namely: Feeling Safe and Feeling in Control. However, for the labouring women there is only one positive effect when CEFM is implemented, that is Feeling Reassured by the technology. The other consequences have a negative impact on the woman, these include: More Interventions and Limited Choices.

**Paradigm Process in Summary**

The decision-making process within the paradigm has been described as consisting of varying interactions, such as the five dimensions of trust and the manner they influence decision-making; actions, including Gathering Baseline Information, Deciding to Use CEFM; interruptions, such as Workloads and consequences that included midwives feeling safe and women having limited choices. This complex process was shown to evolve over time and includes interactions with the woman and other staff. The paradigm process is represented in its complexity within the paradigm structure to present the complete decision-making paradigm (Figure 4.2). This paradigm outlines the factors influencing midwives to use CEFM on low risk labouring women and presents the substantive theory, Midwives' Decision-making about CEFM, despite EBCPG.

**CONCLUSION**

This chapter has presented the results of this GT study, which have informed the emergence of the substantive theory. It was discovered that midwives are strongly influenced by trust when making decisions to use CEFM on low risk labouring women. Five dimensions of Trust were identified including, Trust in Policy, Trust in 'Woman', Trust in CTG Technology, Trust in Clinical Judgement and Trust in Others. Workloads

also impacted on the decision-making pathway of the midwives in this study and Risk Management and Medical Dominance were found to broadly dominate the current health culture. The final chapter will discuss how this theory and other key findings relate to current literature and their impact on the clinical setting.

**CHAPTER FIVE: DISCUSSION****INTRODUCTION**

This chapter presents a discussion of the findings and recommendations relating to this GT study of midwives' decision-making and the use of CEFM on low risk labouring women. Factors that influenced midwives to use CEFM on low risk labouring women were also identified. Findings indicated that Risk Management and Medical Dominance broadly influenced the health culture, whilst labouring women remained contextual to decision-making processes and were offered limited choices during labour. Trust and Workloads were found to impact profoundly on midwives' decision-making and a substantive theory: *Midwives' decision-making about CEFM, despite EBCPG*, was developed.

A preliminary review of the literature on the research topic was presented in Chapter Two, whilst Chapter Four detailed the findings from this study. The main findings will be summarised in this chapter along with a further literature review, specific to selected findings of this study, in particular decision-making and the central theme of Trust. This literature will be incorporated with the existing literature, to position the findings of this current study. How this research strengthens or challenges previous findings will be explored. The implications for the findings on the health environment including staffing, training and education and health organisations will be outlined and final recommendations will be made.

Recommendations include that women be intimately involved in the decision-making process about foetal monitoring through the introduction of community based, midwifery led models of care. Other recommended workplace reforms incorporate staff training that includes a reflective practice model specific to the use of foetal monitoring

and the introduction of a clinical decision support system. Strategies are proposed for health services to address workload issues and mistrust between professionals by developing a culture that values trusting, compassionate and nurturing behaviours. Recommendations for further research are also proposed. A summary of study limitations is presented and final conclusions draw the chapter to a close.

## **CLINICAL DECISION-MAKING**

A midwives' decision-making pathway for foetal monitoring has been identified through this GT study (Figure 4.1 – see page101). Previous research on clinical decision-making has identified phases and theories of decision-making and various factors such as educational, experiential levels and role value, as having an impact on decision-making (Hoffman, Donoghue & Duffield, 2004; Lauri et al., 2001). Findings of this current study will be compared to other literature, particularly the decision-making model by Lauri et al. and current literature emphasising *woman centred* midwifery care (Page, 2000).

Clinical decisions in nursing, according to Lauri et al, are characterised by two main phases (2001). Initially, in a 'diagnostic phase' data are collected by taking observations and collecting information from and about the client. This information is then processed by the clinician and a problem identified or opinion formed about the situation. Secondly, a 'management phase' is undertaken whereby care plans are formulated and actions implemented (Lauri et al).

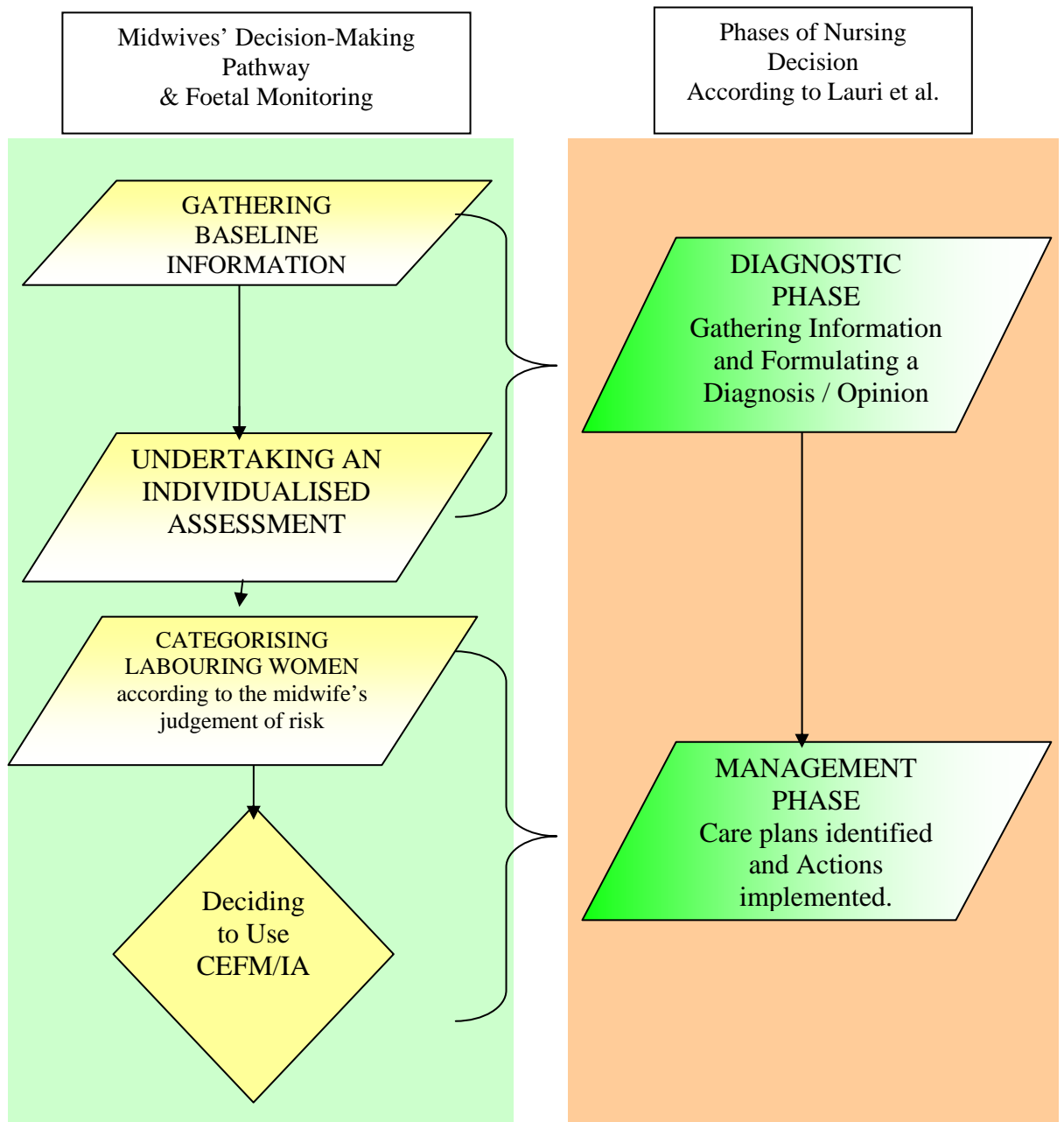
This decision-making process is similar to that identified within this current study of midwives' decision-making and foetal monitoring. 'Gathering baseline information' described the midwives collecting information about the woman, including reading the

medical record, listening to the woman's story, and taking vital signs, such as blood pressure. 'Undertaking individualised assessment' represents the midwives analysing the baseline information to make an individualised assessment, specific to the labouring woman in their care. Combining 'gathering baseline information' and 'undertaking individualised assessment' would result in a similar phase to that of the 'diagnostic' phase identified by Lauri et al. Both of these pathways share the same activities, that is, the nurse or midwife collecting information about the client and then analysing the information to form an opinion.

Secondly, the 'management phase' (Lauri et al., 2001) where the nurse formulates care plans and actions them could also be likened to the midwives' decision-making model discovered from the current study. Combining the processes of 'categorising labouring women according to the midwives' clinical judgement', where the midwife identifies the labouring woman as low or high risk and 'deciding to use CEFM or IA', which represents the actioning of the midwives' foetal monitoring plan, would fit into the description of the 'management phase' described by Lauri et al. (Figure 5.1).



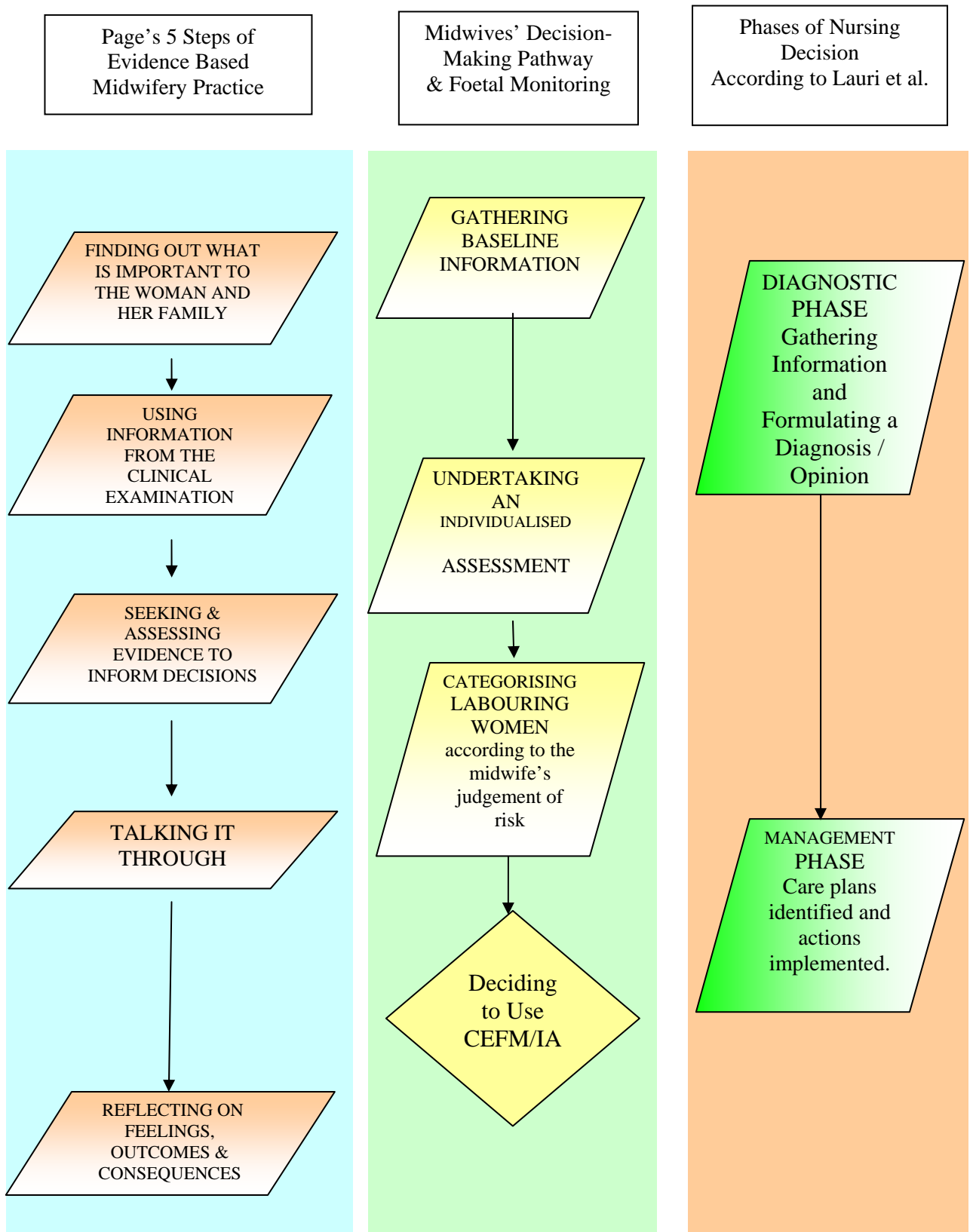
**Figure 5.1: Comparing Midwives' Decision-Making Pathway and Phases of Nursing Decision according to Lauri et al., 2001.**



Both the nursing decision-making process and the current study's findings encompass an initial phase of gathering information and considering its meaning, followed by planning and implementing an action. In reviewing this information on clinical decision-making, the following broad finding can be presented: When deciding on foetal monitoring for low risk labouring women, the midwives in the current study used a decision-making process that was similar to that of the nursing decision-making process according to Lauri et al.

It is, however, noted that neither of these decision-making pathways demonstrates the involvement of the client as part of the decision-making process. This is a deficit in view of the current health culture that promotes a partnership model of care involving the client in informed decision-making across the continuum of health care (Page, 2000). A midwifery model of evidenced based practice, proposed by Page, draws on the principles of partnership and involves the woman during all care decisions. Page's five steps to practicing evidence based midwifery includes: Finding Out What Is Important To The Woman And Her Family; Using Information From The Clinical Examination; Seeking And Assessing Evidence To Inform Decision; Talking It Through; and Reflecting On Outcomes, Feelings And Consequences. Each step will be explained and compared to the previous pathways discussed. Additionally, the following diagram (Figure 5.2) provides a visual representation of the three models.

Figure 5.2: Comparing Three Pathways



Finding Out What Is Important To The Woman And Her Family is the first recommended step to evidence based midwifery according to Page (2000). This step involves discussing the woman's hopes and anxieties and preferences for labour and birth. Some of this information may have already been discussed previously if the woman is being cared for by a known midwife or may be documented in a birth plan. This step could be integrated into Gathering Baseline Information as both steps involve a similar process whereby the midwife collects information about the woman, including listening to the woman. However, stating this as a separate and first step with the specific title of Finding Out What Is Important To The Woman introduces the principle of partnership between the woman and the midwife. Actioning this as a priority and in an immediate manner, further demonstrates the degree of importance of involving the woman in her care.

To gain information specific to foetal monitoring a series of open ended question may be posed. For example: 'How do you feel about monitoring the baby during labour?' 'Where you hoping to use water immersion during your labour as a comfort measure?' Questions such as these would give the opportunity for the woman to express her thoughts and expectations openly and the midwife to consider how foetal monitoring methods may impact on this particular woman and her family.

Using Information From The Clinical Examination is described as the second source of information by Page (2000). Information would be gathered by the reviewing the woman's history and a clinical examination. This step is similar to that of Gathering Baseline Information and Undertaking Individualised Assessment as identified from the current study findings and that of the Diagnostic Phase identified by Lauri et al. (2001). This step is similar in all three pathways, however both the current study and Lauri et

al., use this step as the initial step. Page uses it as the second step, further emphasising the importance of the woman's values and desires as a priority within the partnership pathway.

The third step to practicing evidence based midwifery according to Page (2000) is Seeking And Assessing Evidence To Inform Decisions. This step involves the midwife reviewing latest research, policy and EBCPG to inform the woman about options and choices relating to her care. This step is similar to that of Management Phase of Lauri et al. (2001) and to Categorising Women According To Risk, found in the current study.

Talking It Through describes the discussion between the midwife and the woman about the evidence and the midwife's opinion of what would be the best care options for the woman. This step is not evident within either of the previous pathways and is of major importance to ensuring informed choice is made by the women. It is therefore an essential step within any decision-making pathway. The final step is also absent in the previous pathways. This step, Reflecting On Outcomes, Feelings And Consequences goes beyond implementing the agreed decision. Adding this step however, is a good idea to encourage reflective practice and review, which may lead to a change in clinical practice (Gustafsson & Fagerberg, 2004).

Page's pathway includes essential components which emphasise and integrate a partnership model of care and informed choice. A sample decision making pathway has therefore been developed to guide evidence based decision making relating to the use of foetal monitoring in labour. It combines the findings from this study, those of Page (2000) and Lauri et al. (2001). This pathway will now be outlined.

The first step is Finding Out What Is Important To The Woman And Her Family Regarding Foetal Monitoring. As recommended by Page (2000), this step has been included as a priority within the pathway, immediately introducing the principle of partnership as core to the woman – midwife relationship. This step may involve discussing the woman's expectations about how the foetus will be monitored, possible anxieties about risks to the foetus during labour and preferences about comfort measures planned during labour and birth.

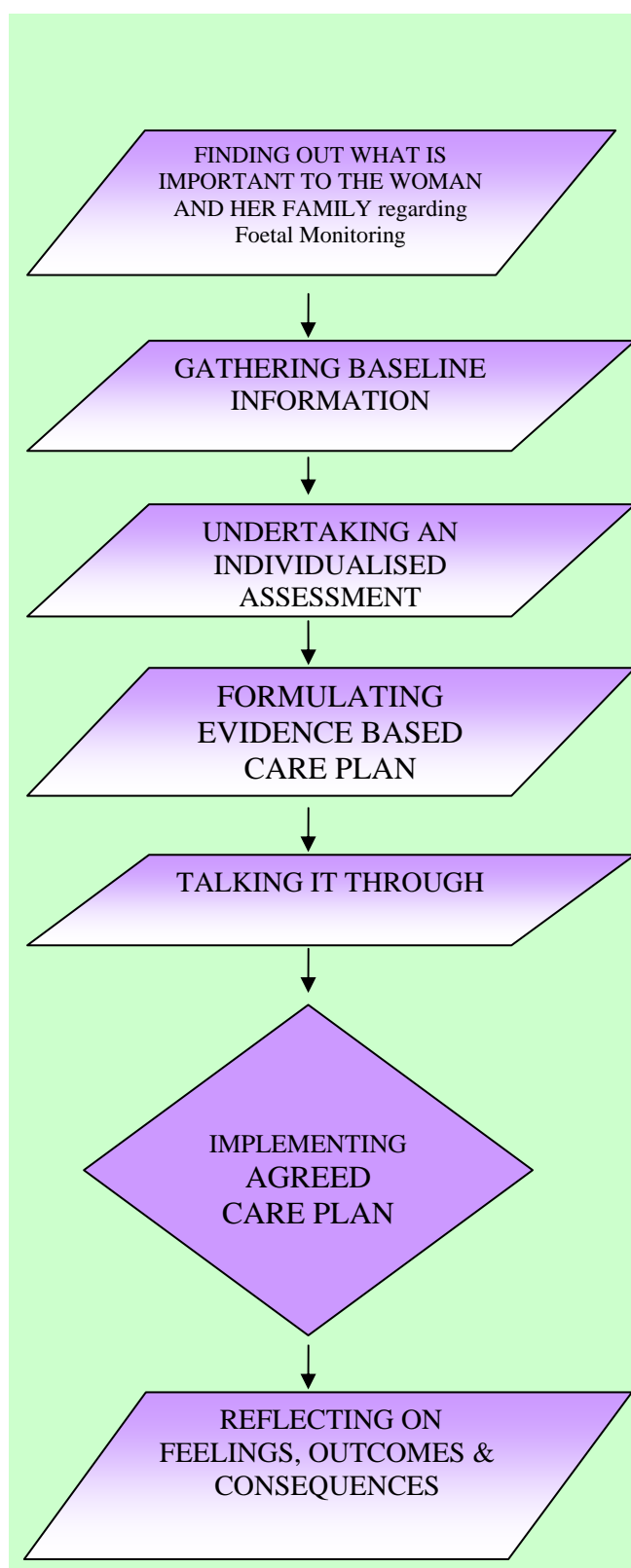
Following this step, Gathering Baseline Information is recommended, consistent with the current study findings, Page (2000) and Lauri et al. (2001). This step may include reading the medical record, taking the client's history and vital signs such as blood pressure, pulse and foetal heart rate. Following this, the health professional is recommended to Undertake an Individualised Assessment. This represents the action of the midwife analysing the baseline information to make an individualised assessment specific to the client in their care, also consistent with the current study. It is also similar to Diagnostic Phase of Lauri et al., in which nurses formulate an opinion and/or diagnosis and Using Information From The Clinical Examination, according to Page.

The next recommended step is Formulating Evidence Based Care Plans. This represents the midwife reviewing clinical practice guidelines and policy documents to formulate the best plan of care for the individual. This step also is consistent with all three previous pathways. The final three steps are Talking It Through; Implementing The Agreed Plan For Foetal Monitoring and Reflecting On Outcomes, Feelings And Consequences.

Talking It Through, ensures *woman centred* care and informed consent. This step represents the midwife explaining to the woman the evidenced based recommendations about foetal monitoring, according to the midwife's findings from the previous steps within the pathway. This explanation includes other care options and consequences of each care option. The woman and her family will then be enabled to make an informed choice about foetal monitoring during labour.

Implementing The Agreed Care Plan For Foetal Monitoring represents putting the agreed plan into action, based on informed choice and evidence based practice.

Finally, Reflecting On Outcomes, Feelings And Consequences facilitates open and honest discussion between the woman and the midwife. In addition it promotes reflective practice for the midwife, which has been shown to be an effective professional learning tool (Gustafsson & Fagerberg, 2004). This pathway is diagrammatically represented in Figure 5.3.

**Figure 5.3: A Sample Decision-Making Pathway about Foetal Monitoring**



The following recommendation is based on the findings of the current study, previous research and from current EBCPG recommending informed choice and *woman centred* care.

***Recommendation 1:***

*It is recommended that a theoretical decision-making pathway be used (similar to Figure 5.3) to integrate and promote woman centred decision-making particularly about foetal monitoring in labour. This pathway may be included as part of foetal monitoring policy and as a tool to educate and train maternity health care professionals.*

Health professionals using this pathway when deciding about foetal monitoring in labour, would involve the woman in the decision-making process whilst using an evidence based practice framework. This pathway could also be used for other clinical decision-making processes.

Clinical decision-making can be influenced by a number of factors according to the literature and findings from the current study. These factors, including trust, clinical judgement and experience, informed choice, evidence based practice and risk management will now be discussed. Initially, trust will be discussed in relation to the findings of this study.

**Trust**

This current study identified Trust as the central category that pervaded the decision-making paradigm, having a profound effect on midwives' decision-making and the use of CEFM on low risk labouring women. Five dimensions of Trust were identified from the data, 1) Trust in Policy, 2) Trust in 'Woman', 3) Trust in CTG Technology, 4) Trust

in Clinical Judgement and 5) Trust in Others. These dimensions were found to strongly influence the midwives' decision-making process.

Trust has been discussed in a variety of previous research studies within the health care environment. Research studies have examined midwives trusting women (Thorstensen, 2000), the implications of trust in nursing practice (Pask, 1995), the trusting relationship between health professionals and clients (de Raeve, 2002), other health professions and health organisations (Felix, 1997) and trust between health organisations (Walker, 2001). Trust has a central importance within the client–carer relationship (de Raeve), teams of health workers and the general health environment itself (Felix; Walker), with trust being the basis of good communication and coordination of competent health care (Felix; Pask; Thorstensen). It is also suggested that under some circumstances, trust can take time to establish and generally, the longer trust exists, the stronger it becomes (Pask). Aspects of the findings of this current study compared to findings in the literature will now be outlined.

### **Trust between Staff**

A study on employee relationships identified that a high degree of trust between employees is energising and creates greater productivity, with organisations more likely to succeed when employees trust each other (Malloch, 2002). The following points demonstrate how the current study adds further support to this finding.

In the current study, mistrust between health professionals increased the likelihood of CEFM. CEFM on low risk labouring women has been associated with higher rates of medical intervention with no improvement to long term neonatal health outcomes (Flood-Chez et al., 2000); therefore, using CEFM on low risk labouring women could be viewed as non-productive. Conversely, if the work environment was characterised by

high trust levels between staff, higher rates of IA would result in less medical intervention and greater overall productivity. These points demonstrate how a high degree of trust between employees could increase productivity within birth suite environments. With the aging midwifery and obstetric workforce in Australia and current national shortages of obstetric and midwifery staff (Weaver, Clark & Vernon, 2005), building trust and improving productivity in the workplace is an important issue.

Building trusting relationships between professional groups can be hindered by increased government regulations and demands on limited resources (Malloch, 2002). A blurring of roles between obstetrics and midwifery adds further complexity to trust building opportunities in the maternity setting. Building trust takes time and health organisations are encouraged to nurture a culture where trusting, compassionate, nurturing behaviours are valued (Malloch, 2002). Furthermore, medical officers and midwives need to be made aware of each other's role and management structures so that respect and clear boundaries exist between the professional groups. Professional bodies, such as the Queensland Nursing Council have developed guidelines outlining the scope of practice of nurses and midwives to further support this understanding (QNC, 2005).

Having medical staff informed of the training and educational requirements and scope of practice of midwives as part of their training and orientation to health organisations may further assist in developing a foundation of professional trust. This inter-professional trust would serve as a firm foundation for trusting relationship to be developed between individual staff members in the workplace, enhancing working relationships, effective decision-making and productivity, in particular in relation to the use of CEFM. In view of these findings, the following recommendation is made.

***Recommendation 2:***

*It is recommended that health organisations include information about the scope of practice of obstetric doctors and midwives as part of the orientation package for maternity staff to ensure clear role boundaries are established and promote a foundation of professional trust.*

In the current study it was demonstrated that mistrust between staff members was an influencing factor when CEFM was used on low risk labouring women. The hospitals in which the study took place had 60 to 70 midwives working within each maternity unit. Most staff rotated through all areas of maternity, including ante-natal clinic, ante-natal day stay unit, birth suite, post-natal ward, home maternity service, and special care nursery. Many of the midwives also worked on a part-time basis. These circumstances make the clinical environment unfavourable to staff getting to know one another and building trust in each other's clinical practice.

One strategy that may address the difficulties of working in an environment characterised by large staff numbers would be to introduce staff to the concept of working in small teams. Staff working together in small teams would have a greater opportunity to get to know one another and potentially develop more trusting relationships. The teams could be made up of midwives and a designated medical officer. This would provide a greater opportunity for medical and midwifery staff to work collaboratively and build trust between one another. Greater trust levels between staff would potentially reduce rates of CEFM on low risk labouring women. Reduced rates of medical interventions, including CEFM, have been found when women are cared for by midwives working together in small teams providing a midwifery model of care (Homer et al.,2001). The concept of trust between health professionals associated

with decreased medical interventions, however, has not been studied. Further research on the impact of positive trust relationships and rates of medical intervention would further add to the knowledge and understanding on this topic.

It is recommended, that managers of health care facilities with large staffing numbers consider introducing the concept of staff working together in small teams, to enable the development of intra-professional and inter-professional trust and that thorough evaluation be undertaken to measure the impact of this strategy.

***Recommendation 3:***

*Managers of maternity health care facilities with large staffing numbers consider introducing the concept of staff working together in small teams, to enable the development of intra-professional and inter-professional trust. Following implementation, research should be undertaken to measure levels of trust between health professionals, and the relationship between this and rates of interventions during labour.*

**Trust and Decision-making**

Trust was found to profoundly influence the midwives in the current study when deciding to use CEFM. No other research relating to trust and decision-making about CEFM was found in the literature. However, a study examining the relationship between client's decision-making and trust levels in their medical officers (Kraetschmer, Sharpe, Urowitz & Deber, 2004) can be broadly applied to the decision-making approaches of the midwives, to explore similarities and differences in the findings.

Clients' decision-making about health matters and levels of trust in their physicians was explored utilising the Problem Solving Decision-Making Scale and the Trust-in Physician Scale (Kraetschmer et al., 2004). Six hundred and six respondents completed questionnaires and decision-making was termed as passive, shared or autonomous, whilst trust levels were graded as low, moderate, high and blind. Clients deciding about their health issues autonomously were found to have low trust levels in their physician, whilst respondents who took a passive role in decision-making were more likely to have high or blind levels of trust in their physician. Clients who made shared decisions had high but not blind levels of trust in their physician. These findings can be broadly applied to the midwives' decision-making approach in this study because of the link between decision-making and the dimensions of Trust; for example, the less experienced midwives approached decision-making with a high level of trust in policy.

Clients who had a high or blind level of trust in their physician, developed a passive approach to decision-making (Kraetschmer et al., 2004). Similarly, the less experienced midwives could be said to approach decision-making in a passive manner and have a blind level of trust in policy. Conversely, the more experienced midwives approached decision-making with a high level of trust in clinical judgement and a low to medium trust in policy. These midwives saw policies as a guide "when you were unsure of yourself" (Data Segment: 1:17). This notion is shared by other professionals as demonstrated by the following quotation from an obstetric consultant:

guidelines help those who need guidance but an experienced practitioner does not need guidance (Johnson, 2002, p: 109).

The study by Kraetschmer et al. (2004), found that clients who had a medium to low level of trust in their physician indicated a higher level of decision-making involvement and that increasing knowledge about a subject, increased the likelihood for the decision-

making to move from a passive to a shared or autonomous approach. From this perspective, it could be inferred that the more experienced midwives with greater levels of clinical experience, who demonstrated a medium to low level of trust in policy became active in their decision-making and were found to be autonomous in their decision-making approach.

Conversely, the less experienced midwives chose a passive decision-making position because their knowledge base or clinical judgement is still developing hence their reliance on policy. According to the findings from this study and that of Kraetschmer et al. (2004), clinical judgement, knowledge and an experiential foundation influence the decision-making process, however, the specific impact on decision-making remains complex. Research studies exploring clinical decision-making recognise the complexity of decision-making processes and the difficulties of measuring influencing factors and outcomes (Dowding & Thompson, 2003).

### **Clinical Judgement**

Evaluating the impact of a clinical judgment on decision-making in health care has been identified as a complex process (Dowding & Thompson, 2003). Clinical judgement involves the integration of information to arrive at an overall assessment; however, assessing the outcome of using clinical judgement is difficult, due to the uncertainty of health outcomes (Dowding & Thompson). Complex evaluation methods have been developed to study the impact of clinical judgement and decision-making in nursing, despite this, no clear outcomes have been determined about how effective clinical judgements are on decision-making (Dowding & Thompson).

In the current study, trust in clinical judgement was identified as a factor that influenced the midwives' decision-making about using CEFM. The more experienced midwives held a high level of trust in their own clinical judgement, whereas the less experienced midwives did not. The effectiveness of more experienced midwives' clinical judgement was not measured during this study. Further research could be undertaken to measure the effectiveness of clinical judgement in midwives' who hold high levels of trust in their clinical judgement abilities. Outcomes of decisions based on clinical judgement and the use of CEFM could be compared to foetal outcome indicators. This may provide a greater insight into the value of clinical judgement in decision-making.

***Recommendation 4:***

*Further research be undertaken to explore the impact of trust relationships and clinical judgement on decision-making, particularly about the use of foetal monitoring.*

**Level of Clinical Experience**

Benner's framework of nurse expertise levels is well renowned (1984). Benner found that nurses move through stages of development from novice to expert, the expert nurse demonstrating an intuitive knowing or subconscious competence, rather than gaining a number of years of experience. Paul and Heaslip (1995) found that expertise exists when the nurse integrates appropriate nursing knowledge and skilled judgement into delivering care to clients. Other studies, however, use the five year time frame to define a practitioner as an expert (Butterworth & Bishop, 1995). This study found that the less experienced midwives were dependent on policy and did not yet integrate judgement skills into their decision-making about foetal monitoring, rather they followed policy guidelines. The more experienced midwives integrated their assessment skills and



clinical judgement to make decisions autonomously. This may indicate that the less experienced midwives remained at novice status due to their limited years of experience and the more experienced midwives had reached expert status.

This analysis is made with caution however, because of the small number of participants in this study and the significant difference in years of experience between the less experienced and more experienced midwives. The more experienced midwives all had greater than ten years experience and the less experienced midwives had less than two years experience. It may have been beneficial to have a midwife who had five years experience within the participant cohort, so that comparisons could be drawn from midwives with a medium level of experience also.

The less experienced midwives followed policy guidelines, based on their trust in policy. This may also be interpreted as meaning that a high level of trust in policy is an enabler to decision-making processes based on policy. However, if midwives developed such a high level of trust in policy that they no longer questioned policy based practices, this may be detrimental to *woman centred* care. These midwives could potentially become habitual in their clinical practice, resulting in practice that is standardised, yet less individualised rather than evidence-based, integrating both research evidence and clinical judgement (DeBourgh, 2001).

Furthermore, the less experienced midwives who had both recently completed their tertiary qualification in midwifery, may have a higher degree of trust in policy due to a greater understanding of evidence based practice and policy guidelines. Again, caution is required, due to the small number of participants in this study. However, this finding would add support to previous research findings, discussed in Chapter Two

(McCaughan et al., 2002; Meah et al., 1996). Meah et al. found that understanding research findings was a significant barrier to implementing evidence based clinical practice for some midwives (Meah et al.), whilst McCaughan et al. found that hospital trained nurses were more likely to experience internal conflict relating to their inability to use research effectively. The more experienced midwives who were hospital trained may have not gained an understanding of evidence based practice and research leading to their greater trust in clinical judgement rather than policy.

Policy makers need to ensure that policy documents clearly articulate a *woman centred* approach, informed choice and are stated in a manner that offers supportive guidance to evidence based practice. Policy makers also should ensure regular updating of policies to incorporate latest evidence based recommendations with changes communicated effectively to all staff. The following recommendation is drawn from these findings.

***Recommendation 5:***

*Policy makers ensure policy documents regarding foetal monitoring are comprehensive and explicit in their explanations to ensure adequate and accurate information to support evidence-based practice, women-centred decision-making and informed consent.*

**Evidence Based Practice**

To apply the definition of evidence based practice to the context of the midwives' decision-making and CEFM, the experienced midwives could be said to have applied evidence based practice some of the time by using the current and relevant information, integrated with their clinical judgement (DeBourgh, 2001). At times, however, the more

experienced midwives also used the baseline CTG trace on admission for all labouring women; a practice not based on current evidence. This adds to the complexity of the findings. Concern is raised about whether these midwives were following clinical judgement and a 'routine', rather than clinical judgement and evidence based information. Ensuring that decisions are also *woman centred* would promote individualised decision-making rather than following a routine. This conclusion adds support to Recommendation One, regarding the use of the Decision-Making Pathway integrating Informed Consent (Figure 5.2).

### **Woman Centred Decision-making and Informed Choice**

According to the findings from this current study, midwives described most clients as being passive in the decision-making process about CEFM, with the midwives perceiving that most women held high levels of trust in health professionals. Most women were described as non-participatory in decisions about foetal monitoring and remained contextual to the decision-making process. On many occasions informed consent was not offered to labouring women prior to CEFM being utilised. Whilst it could be assumed that the women gave inferred consent for the CTG to be used (by allowing the midwife to apply the belts and monitoring devices), it could be questioned as to whether the consent was informed. Had informed consent been offered, the midwives would have described the women being actively involved in the decision-making process and central, rather than contextual to the decision-making process. This finding adds support to a recent study on foetal monitoring.

A Queensland study by Lewis & Rowe examined the clinical practice of midwives regarding foetal monitoring on low risk labouring women (2004b). This study examined how midwives viewed their foetal monitoring practices by conducting focus groups.

Two groups were conducted, one with five newly graduated midwives and the second, eight experienced midwives. One finding that is strengthened by the findings of the current study, was the lack of informed choice for women prior to the use of CEFM. (Other findings from Lewis & Rowe research will be integrated throughout the remaining of this chapter.)

Informed choice involves providing clients with full information about interventions, including risks, benefits and alternatives to the intervention (Wood, 2003). The client also must know that they have a right to decline the intervention, without any consequence (Olds et al.). Reflecting on the findings of Kraetschmer et al. (2004), increasing knowledge about a subject increases the likelihood that decision-making will move from a passive to a shared approach. Therefore, by following informed choice principles and including a discussion about options of foetal monitoring, this position of increased knowledge would offer the woman an opportunity to move from being a passive decision-maker to a shared decision-maker. Kraetschmer et al. found that clients experiencing non-life threatening decision-making preferred a shared decision-making approach. This conclusion leads to a further recommendation:

***Recommendation 6 (a):***

*Informed choice is offered to all women regarding foetal monitoring in labour. This will ensure decision-making is a shared and individualised process, central to a woman's care.*

Some professionals have questioned whether or not a pregnant woman has the knowledge or right to make an informed choice about foetal monitoring, however, there is no support for using foetal monitoring without informed consent (Wood, 2003).

Rather, offering women the opportunity to be intimately involved in decision-making has benefits to their self-determination and autonomy (Wood). This notion of self-determination was also found in reports from Queensland women as part of the Re-Birthing report. Women reported being disappointed with their lack of choice and participation in decision-making, wanting choice and control, especially when it comes to pregnancy and birthing; a 'normal' part of their lives (Hirst, 2005).

Furthermore, evidence based guidelines also recommend that a discussion about CEFM should include the woman and the woman should be consulted and offered informed choice regarding CEFM (ROCG, 2001; Wickham, 2003). This was clearly not the finding in this current study. A lack of detail and consistency surrounding the information given to clients prior to the use of the CTG was found. Four of the five midwives in this study gave guarded information to women. The midwife, who reported giving thorough information, including risks and benefits of CEFM, stated that she only did this if there was time. None of the midwives in this study offered the information that CEFM may be declined.

The inadequate level of information provided to women and inconsistency of information from their health care professionals was also raised in many submissions from women to the reviewers during the Queensland Maternity Services Review (Hirst, 2005). Conflict between midwives' beliefs and women's choices and the potential of this to affect quality of care has also been raised in other literature. Thorstensen (2000) recognised that at times, conflict can occur between what a woman wants and what the midwife believes the woman needs. The conflict can result in dissatisfaction for the woman, midwife or both (Thorstensen). To compare Thorstensen's notion with findings

from the current study, it could appear that the midwives in this study appeared to assert their beliefs about the need for CEFM by offering the women little choice about CEFM.

Women have the legal and ethical right to be informed about what is happening to them and to make choices about their health care, including ways to monitor the foetal heart rate (NICE, 2001). Promoting the use of an information pamphlet, specific to foetal monitoring, may further ensure families are informed about foetal monitoring. This pamphlet could be made available to all families during pregnancy and particularly prior to the use of CEFM. This would standardise information giving and offer families time to learn about foetal monitoring choices prior to the onset of labour. Pamphlet use has been found to be a useful tool to improve patient knowledge and skills when used prior to surgical procedures (Hodgkinson, Evans & O'Neill, 2000).

The National Institute for Health and Clinical Excellence have produced a booklet titled 'Monitoring your baby's heartbeat in labour' (NICE, 2001). (APPENDIX 4: 'NICE' Foetal Monitoring Information for Families). A thorough explanation in a language that is suitable for families about the foetal monitoring options, advantages and limitations are included within this booklet. It is recommended that this be used to further ensure informed choice for women and their families.

***Recommendation 6 (b):***

*It is recommended as part of the informed choice process, that written information on foetal monitoring be provided to all families prior to labour and on admission to birth suite. Using the booklet similar to 'Monitoring your baby's heartbeat in labour' will support standardisation of information to families as part of the informed consent process.*

A concern must be raised from the study findings as to whether midwives are meeting their professional obligation to inform women prior to procedures, such as CEFM. Midwives are bound by professional standards that prescribe that midwives fully inform clients and act as advocates for women and their families (QNC, 2005). Both the ACMI and the QNC support the notion of advocacy and autonomy in their competency statements and scope of practice framework. Therefore, midwives should be encouraged to reflect on their professional conduct and competency statements regularly as part of the professional development and the provision of optimal care for women.

A study focusing on the continuing use of CEFM on low risk labouring women, despite evidence based guidelines and policies, explored using an ethical decision-making model to promote midwives' decisions based on ethics and their advocacy role (Wood, 2003). The ethical model involved applying principles including autonomy, justice, beneficence and non-maleficence to the use of CEFM.

Wood described how through their advocacy role, midwives enable women's autonomy and promote justice. Women's right to justice includes being aware of the choices regarding methods of foetal assessment and the possibility that there will be an increased rate of intervention if CEFM is utilised (Wood, 2003). The issue of beneficence, or to do good, is maintained by explaining to women that it is unnecessary to use CEFM unless there are certain clinical indicators. To address non-maleficence, or to prevent harm, the midwife facilitates the woman freely moving around and accessing comfort measures without the limitations CEFM imposes. Wood further points out that the woman is unable to make an autonomous decision without being informed fully.

This in-depth analysis of decision-making based on an ethical model offers midwives an opportunity to reflect on and re-examine their decision-making processes and duties as a midwife. The process of reflective practice has been found to be useful in changing the clinical practice of clinicians (Gustafsson & Fagerberg, 2004). Providing opportunities for staff to reflect on their practices relating to CEFM by using Wood's ethical decision-making model may further decrease the rates of CEFM on low risk labouring women. It is therefore recommended by this study that facilitators of health education and training use Wood's ethical framework as a strategy to promote the reflective practice of all clinicians working in the birth suite, to promote *woman centred* decision-making and informed choice about foetal monitoring.

***Recommendation 7:***

*Facilitators of health education and training use Wood's ethical framework to promote the reflective practice of all clinicians working in the birth suite, to promote woman centred decision-making and informed choice about foetal monitoring.*

An informed decision-making process about foetal monitoring satisfies both clinical practice recommendations regarding informed consent for clients and professional standards for midwives. Policy makers, professional bodies and client advocates promote informed consent prior to all procedures. Findings from this study suggest these representative bodies have further work to undertake to promote consistency of clinical practice by Queensland midwives.

**Risk Management and Decision-Making**

Offering women the opportunity to be involved in decision-making not only has benefits of client self-determination but also the shared responsibility of decision-



making would potentially lessen the level of responsibility that clinicians feel in many decisions during labour and birth care (Hirst, 2005). Rather than the clinician making decisions alone, the decisions would be an agreed plan of action that is ultimately directed by the client (Hirst; Page, 2000). This would have broad reaching benefits both to medical officers and midwives and would impact on the risk management approach to maternity care across the continuum. For example, medical staff could offer advise on the use of CEFM but the final decision to monitor using CEFM would remain with the woman, thereby reducing the potential of medical dominance and litigation claims. This would impact upon the risk management approach taken to maternity care in Queensland.

Risk Management was identified as a contextual category to midwives' decision-making processes and a link was identified between Risk Management and Feeling Safe. It was discovered that these midwives acted in a manner that would ensure they did everything possible to reduce the risk of an adverse outcome, both for the family and self. The midwives wanted to avoid traumatic professional experiences and any risk to their professional integrity by being able to justify their every action in the event of an adverse outcome. Data revealed that CEFM rates increased following clinical incidents with some traumatic incidents impacting on the midwives' decision-making for many years following the adverse event. Given these staff behaviours, it would seem justified that clients be intimately involved in the decision-making process.

When women are fully informed about risks, but at the same time empowered by shared decision-making, an holistic approach is taken, with the woman viewing what she believes may be risks, specific to her own circumstances (Page, 2000). This concept is supported by Hirst (2005) regarding Queensland women, stating that risk management

needs to be viewed from the woman's perception of 'safety'. Hirst further suggests that safety means psychological, social and physiological safety, rather than 'risk avoidance at all cost' as espoused by the medical model, which continues to exert dominance within many maternity services within Queensland Health. An environment of medicalisation and 'risk and defensive medicine' in Queensland was also reported in the findings by Lewis & Rowe (2004b). These findings add further support to previous recommendations presented within this chapter regarding informed and shared decision-making processes.

A further question could also be raised regarding the objectivity of a clinician who has experienced a traumatic clinical incident. It was identified from the current study that clinicians were more reactive following these events with intervention rates increasing. An effective computerised system to support clinical decision-making about foetal monitoring could be introduced. This would promote objective information being given to women during the informed consent process, rather than a biased view from a clinician traumatised by previous clinical incidents.

An effective clinical support system is a computerised system in which data is entered and client-specific recommendations are issued (Kawamoto, Houlihan, Balas & Lobac, 2005). A clinical decision support system could be set up to direct midwives and medical officers during labour care and include directions regarding the method of foetal monitoring according to evidence-based guidelines. This would eliminate reactive type decisions, for example, CEFM being used more commonly after recent adverse events in the clinical area.

Decision support systems have been evaluated and reported in the literature. A systematic review of 70 randomised controlled trials evaluated the ability of decision support systems to improve clinical practice (Kawamoto, Houlihan, Balas and Lobach, 2005). Decision support systems had a variety of features and supported decision-making about chronic disease, acute medical conditions, psychiatric conditions, pharmacotherapy, the use of surgical and non-surgical procedures, radiology referrals, laboratory test ordering and immunisation. The use of the decision support systems significantly improved clinical practice in 68% of trials. However, when examining systems that had specific features found to make systems maximally available to staff, such as automatic provision of recommendations and provision of support at the time and location of decision-making, 94%, were found to improve clinical practice.

Even though there were no evaluations pertaining to decision support systems for foetal monitoring, the potential to improve clinicians' adherence to recommended care standards in other areas by the decision support system can not be overlooked. Implementing a decision support system in birth suites to guide all clinicians would be of assistance, in particular, to junior medical officers, junior midwives, midwives re-entering the workforce, midwives who have been following traditional practice rather than evidence-based practice and those exposed to traumatic adverse clinical events. A system such as this would give unbiased judgement about the best way to monitor the foetus; clinicians could then use this information to inform the client.

It must be emphasised that a decision support system would not be designed to replace a process of informed choice involving the woman; rather, the system would support clinician's decision-making process so that non-biased information is offered to the woman during the consultation. Informed choices for the woman would remain vital

even in the event that a decision-making system was used. The following recommendation is therefore presented:

***Recommendation 8:***

*Health care institutions implement the use of clinical decision support systems to birth suites to support objective information delivery to women during the informed consent process about foetal monitoring.*

Risk management is a significant part of the structured environment of the hospital based setting in which the ‘normal’ process of pregnancy and birthing have been incorporated in mainstream maternity services in Australia (Hirst, 2005; Lewis & Rowe, 2004). This study has demonstrated that decision-making processes by health workers, particularly midwives, are potentially impacted by this hospital based risk management culture. It therefore offers support to a further recommendation made by Hirst that maternity services are offered within community settings wherever possible. This would place maternity services predominantly in the public health and well-being sector of the health system, rather than in the acute-based curative service that the hospital sector traditionally offers (Whitehead, 2005). Such changes would promote the concept of pregnancy and birth being part of a normal life event and potentially change the culture of maternity services in Queensland. This culture change could impact on reducing rates of CEFM on low risk labouring women.

The current study findings indicated that women expect to have equipment such as CTGs, used in hospitals. In this technological age there is an almost pervasive presence of information technology within health care settings and clients have an expectation for

health care providers to use high levels of technology (Selinger, 2004). This is significant because the midwives reported that most women did not question the use of CEFM, which further contributed to the labouring woman remaining contextual to midwives' decision-making and CEFM. Part of the recommendation made by the review of Queensland's Maternity Services (Hirst, 2005) included that maternity services should be offered within community settings wherever possible.

Offering the majority of maternity care from community settings would further promote the concept of pregnancy and birth being part of a normal life event and potentially change the culture of maternity services in Queensland. Furthermore, the medicalised culture of birthing is being challenged in the western world (Johanson et al., 2002) with policy makers and governments being recommended to address this issue worldwide by introducing midwifery led models of care (Hirst, 2005; WHO, 1998). This culture change could impact on reducing rates of CEFM on low risk labouring women.

There is strong evidence to support the implementation of midwifery based continuity of care models, with more women reporting positive childbirth experiences, less interventions during labour, including less use of CEFM and more normal birth (Biro, Waldenstrom & Pannifex, 2000; Hodnett, 2005; Homer, Brodie & Leap, 2001; WHO, 1999). Successful outcomes have been attributed not only to the model but also to the 'right attitude'. This attitude consists of developing a culture of birth as a normal physiological process (Johanson et al., 2002). This attitude has also been promoted through the WHO with a release of a document titled 'Care in Normal Birth' in attempt to standardise and normalise birth worldwide (WHO, 1999).

Within the 'Care in Normal Birth' document common practices during the conduct of normal childbirth are categorised into four groups according to their usefulness,

effectiveness and harmfulness (WHO). IA was categorised as Category A, a practice which is demonstrably useful and should be encouraged; whereas CEFM was categorised as Category D, a practice which is frequently used inappropriately (WHO). Introducing midwifery led models of care for women experiencing normal pregnancy will promote a philosophy of care based on pregnancy and birth as primarily physiological process, thereby emphasising the woman's ability to nurture her foetus. IA is considered the best option for women who are experiencing normal birth and therefore CEFM would be less likely to be considered.

Midwifery led models of care emphasise continuity of midwifery care, promoting a partnership between women and midwives. Women have the opportunity to develop rapport and get to know their midwife / midwives during pregnancy so that during labour there is already a foundation of trust established within the midwife-woman relationship (Homer et al., 2001). In this current study, findings indicated that women already trust midwives, however midwives did not always trust in 'woman', thereby increasing rates of CEFM. This perhaps influenced the more experienced midwives to use baseline CTGs on all women. Working within a continuity of carer model and under the philosophy of promoting normal birth, would provide an opportunity for midwives to challenge these lack of trust issues and potentially develop greater levels of trust in 'woman'. Continuity of carer models are also commonly characterised by midwives working with the support of a small group of other midwives (Homer et al.). This would fit in with the previous recommendation regarding the formation of small team of staff to enable improved trust relationships between health professionals. These factors would help to lower rates of CEFM on low risk labouring women.

An Australian study has shown evidence of decreased rates of CEFM in midwifery led models of care (Biro et al., 2000). A randomised control trial was conducted in Melbourne on 1000 low and high risk women comparing standard care with Team Midwifery Care (Biro et al.). Women were randomly assigned to 'team care' that consisted of a team of seven midwives collaboratively working with obstetric staff and 'standard care', a variety of midwives and obstetric staff. Results about procedures during labour indicated clearly those women in the 'team care' group received less CEFM than 'standard care'. 54.3% of team care women were monitored in labour with CEFM whilst 62.2% of women in the standard care group had CEFM. This gives evidence to midwifery led, continuity of care models reducing rates of CEFM on labouring women. The following recommendation is therefore posed:

***Recommendation 9:***

*Maternity services shall be offered within community settings wherever possible under midwifery models of care, to enhance the health and well-being milieu of pregnancy and birth.*

In summary risk management needs to be viewed in an holistic manner, this process will be enhanced by shared, informed decision-making processes that are based on objective clinical information. Maternity care undertaken in community based settings and midwifery models of care, will further normalise the culture of pregnancy and birth in Queensland. This culture shift may also impact on changing the workloads associated with maternity care.

**Workloads**

Rates of CEFM on low risk labouring women were found to increase as a result of workload issues in this current study. Workloads were found to interrupt the midwives' decision-making pathway for foetal monitoring (Figure 4.8, page 143). The midwives used CEFM during busy shifts as a 'babysitter' or as a 'time filler'. It was found that midwives felt that it was quicker to 'flit' into the woman's room and look at the CTG, compared to having to palpate the woman's abdomen and auscultate the foetal heart rate. On other occasions, the volume of the foetal heart was increased so that it could be heard outside of the room, eliminating the need for the midwife to even enter the room at all.

Workload issues impacting on the use of CEFM was also a finding of Lewis and Rowe's Queensland study (2004b). Staffing, workload organisation and time were found to be major influencing factors leading to midwives using CEFM rather than IA, with midwives stating that it was quicker to use CEFM than IA when they were busy. In the current study, some midwives also perceived that the women felt attended to by the CTG machine in their absence. This perception also impacted on the rate of CEFM under circumstances characterised by demanding workloads.

An independent review of Queensland Health's administrative, workforce and performance management systems during 2005 found that health professionals are working in environments characterised by rising workloads and growing community expectations about what health services can deliver (Forster, 2005). Workforce shortages have also been identified as a problem (Forster). Addressing the shortages of health professionals is beyond the scope of this study, however, as workload issues



impact on rates of CEFM this study adds strengths to reports stating that more midwives are needed in Queensland to effectively provide labour care for women (Forster).

A much more simplified strategy that may potentially reduce workloads, is to further challenge the way some midwives justify the use of CEFM on low risk labouring women. Findings from this study indicated that some midwives viewed CEFM as time saving. This thinking can be challenged. Midwives can be encouraged to consider that increased rates of CEFM potentially result in higher intervention rates; therefore, in the long term, using CEFM would actually be time wasting rather than time saving. In addition, recommendations about CEFM include that thorough assessment of the trace should take place every fifteen minutes (SCOG, 2002). To review the CTG effectively every fifteen minutes would take longer than the process of IA. Staff trainers and educators could challenge time saving opinions about the use of CEFM as part of reflective activities (as described earlier as part of recommendation eight). Using a reflective practice framework to challenge midwives' thinking about CEFM as a time saver may further assist in reducing CEFM on low risk labouring women.

***Recommendation 10:***

*Staff educators challenge midwives' thinking regarding CEFM as a 'time saver' by implementing a reflective practice framework as part of ongoing staff education and training.*

**SUMMARY OF RECOMMENDATIONS**

A broad variety of recommendations have been presented relating to the findings of this GT study on midwives' decision-making and CEFM on low risk labouring women. The following table (Table 5.1) presents a summary of the recommendation presented within this chapter. How these recommendations impact on practice will be discussed next.

**Table 5.1: SUMMARY of Recommendations****Recommendation 1:**

It is recommended that a theoretical decision-making pathway be used (similar to Figure 5.2) to integrate and promote *woman centred* decision-making particularly about foetal monitoring in labour. This pathway may be included as part of foetal monitoring policy and as a tool to educate and train maternity health care professionals.

**Recommendation 2:**

It is recommended that health organisations include information about the scope of practice of obstetric medical officers and midwives as part of the orientation package for maternity staff to ensure clear role boundaries are established and promote a foundation of professional trust.

**Recommendation 3:**

Managers of maternity health care facilities with large staffing numbers consider introducing the concept of staff working together in small teams, to enable the development of intra-professional and inter-professional trust. Following implementation, research should be undertaken to measure levels of trust between health professionals, and the relationship between this and rates of interventions during labour.

**Recommendation 4:**

Further research be undertaken to explore the impact of trust relationships and clinical judgement on decision-making, particularly about the use of foetal monitoring.

**Recommendation 5:**

Policy makers ensure policy documents regarding foetal monitoring are comprehensive and explicit in their explanations to ensure adequate and accurate information to support evidence-based practice, *woman centred* decision-making and informed consent.

**Recommendation 6 (a):**

Informed choice is offered to all women regarding foetal monitoring in labour. This will ensure decision-making is a shared and individualised process, central to a woman's care.

**Recommendation 6 (b):**

It is recommended as part of the informed choice process, that written information on foetal monitoring be provided to all families prior to labour and on admission to birth suite. Using the booklet similar to 'Monitoring your baby's heartbeat in labour' will support standardisation of information to families as part of the informed consent process.

**Recommendation 7:**

Facilitators of health education and training use Wood's ethical framework to promote the reflective practice of all clinicians working in the birth suite, to promote *woman centred* decision-making and informed choice about foetal monitoring.

**Recommendation 8:**

Health care institutions implement the use of clinical decision support systems to birth suites to support objective information delivery to women during the informed consent process about foetal monitoring.

**Recommendation 9:**

Maternity services shall be offered within community settings wherever possible under midwifery models of care, to enhance the health and well-being milieu of pregnancy and birth.

**Recommendation 10:**

Staff educators challenge midwives' thinking regarding CEFM as a 'time saver' by implementing a reflective practice framework as part of ongoing staff education and training.

---

**IMPLICATIONS OF THIS STUDY**

This study has significant meaning for all childbearing women, health professionals, health organisations, educators and researchers. The recommendations broadly fall into three categories: implications on clinical practice, implications for staff education and training and implications for further research. The following table outlines which recommendation fits into each category.

**Table 5.2: Categorising Recommendations**

<i>Categories</i>	<i>Recommendations relating to categories.</i>
Clinical Practice	1, 3, 5, 6(a), 6(b), 8, 9
Education & Training	1, 2, 7, 10
Further Research	3, 4

How recommendations impact on these settings will now be discussed.

**Implications for Clinical Practice**

The recommendations from this study relating to clinical practice include significant changes in the way maternity services are provided in Queensland. As described in Chapter One, birthing was once a normal part of family life experienced in the home with midwives supporting women during their birthing process. Gradually, as Obstetrics have taken over maternity care and birthing has moved to hospitals, greater rates of medical interventions are almost considered normal, including CEFM (Johanson et al., 2002). A broad strategy that will further assist in reducing rates of CEFM on low risk labouring women is to ‘de-medicalise birth’.

Recommendations to change the milieu of pregnancy and birth in Queensland include a partnership approach to maternity care, inclusive of a shared decision-making model, central to the woman and the introduction of midwifery models of care within community settings. The partnership approach and shared decision-making model would be inclusive of foetal monitoring in order to address the specific findings of this study. Hirst (2005), supported by Queensland Health (2005) has also recommended changes in maternity care in Queensland by the introduction of a partnership approach to care. Such changes are recognised to need thorough planning and time (Hirst, 2005). Many health districts including the district involved in this study have commenced planning to implement the recommendations in an effective, efficient and feasible manner. It is anticipated that these changes will positively impact on reducing CEFM on low risk labouring women, as well as build trust levels amongst health professionals and in women themselves.

Other study recommendations that will reduce the rates of CEFM, such as promoting *woman centred* care and informed consent should be commenced immediately. Findings from the current study indicated a broad influence of Medical Dominance on decision-making about foetal monitoring; junior medical officers were found to order CEFM unnecessarily and have expectations that CEFM was part of routine care and the more experienced midwives considered that using a baseline CTG was as important as doing a blood pressure reading on admission. Further more, both midwives and medical officers appeared to reactively use CEFM after the occurrence of an adverse clinical event in birth suite. An immediate strategy that could be implemented to address these issues is the use of the booklet 'Monitoring your baby's heartbeat in labour' (NICE, 2001). Distributing this booklet (or one similar) to all families prior to labour and on admission to birth suite would enhance informed consent processes about foetal

monitoring and support standardisation of information to families as part of the informed consent process. Families would also be more likely to question the use of CEFM, this may challenge routine practices of staff and trigger a shared approach to decision-making.

Another strategy that could be considered in the short term, is the feasibility of implementing clinical decision support systems for foetal monitoring in birth suites. This would offer a non-biased, non-emotive, evidence based support system to guide the clinician. Informed choice for the woman would remain central to final decision-making around CEFM, even in the event that a clinical decision support systems is used. The system would provide the evidence based foundation of information that is shared the woman regarding the best way to monitor the foetus during labour. The health care professional would still be expected to use their clinical judgement and the woman would continue to be involved in final decisions and care planning.

An additional step to the decision-making process would be required when applying a clinical decision-making system to decision-making about foetal monitoring. For example: On arrival, the health care professional would find out what is important to the woman and family about labour and birthing, including foetal monitoring. They would then collect the labouring woman's data and input it directly into the electronic decision-making support system that would then issue a evidence based recommendation: IA or CEFM. At this point, the clinician would then consider the recommendation along with their own clinical judgement and then discuss the recommended method of monitoring with the woman, informing her fully of benefits, risks, alternatives and the option for the woman to decline the recommendation. The final decision of monitoring would be made by the woman. This example demonstrates

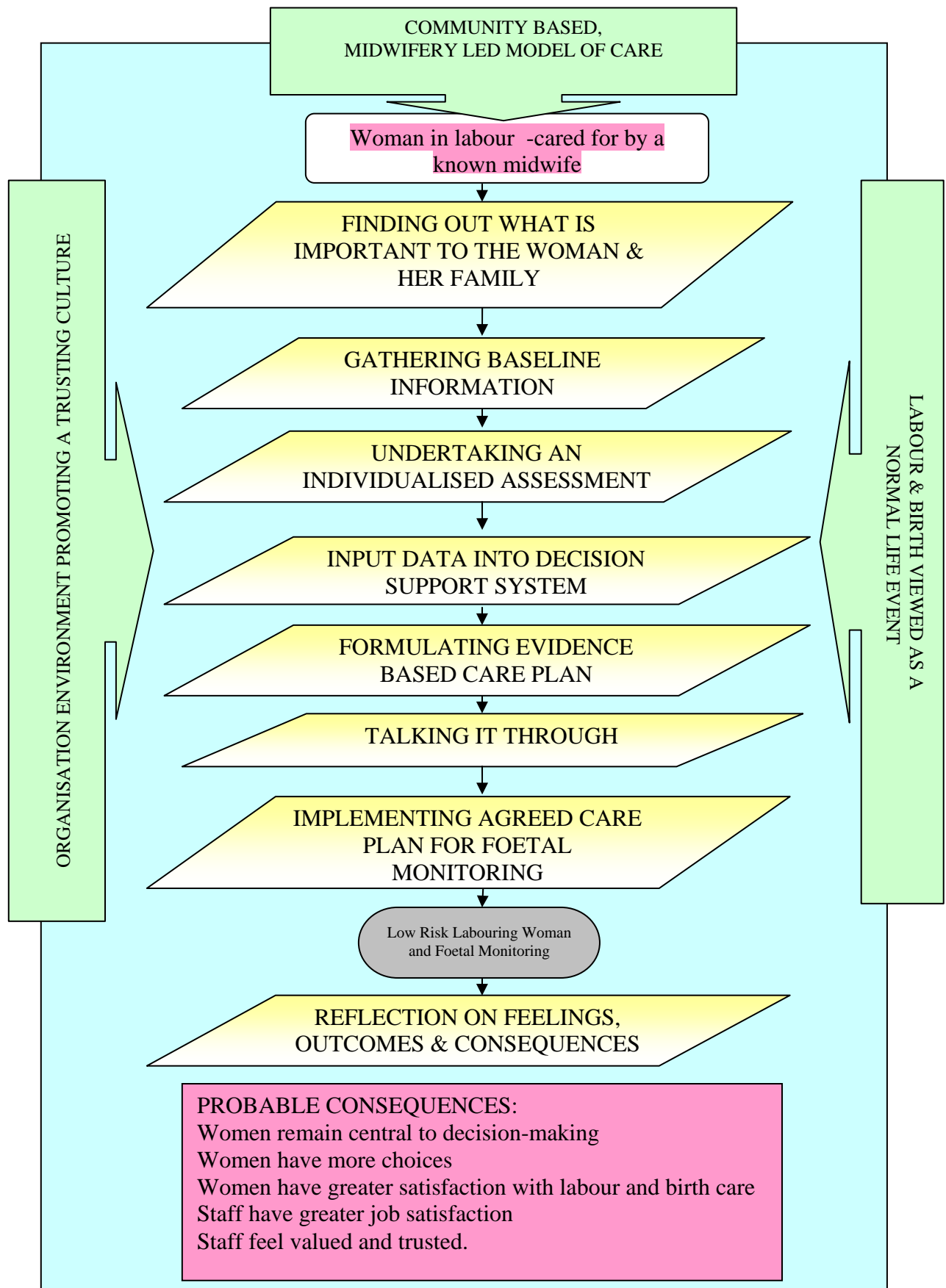
how a decision support system would give an evidence-based foundation to the information that is ultimately shared with the woman.

To further demonstrate this study's implication for clinical practice the following diagram illustrates the framework of clinical decision-making within the changed culture according to the recommendations (Figure 5.4). This diagram is based on the midwives' decision-making pathway discovered during this study. The colour coding scheme has been used identical to that in earlier pathway diagrams.

The green shaded arrows represent the overall influence that the contextual categories will have on the health environment. This study identified Risk Management and Medical Dominance currently impacting on midwives' decision-making. With the recommended changes implemented, it is anticipated that the culture will be positively influenced by work environments based in trust; community based models of care, with the woman central to the model and childbearing seen and supported as a normal life stage. Yellow shading identifies the new supported, *woman centred*, decision-making actions that lead to the midwife informing the woman of her professional recommendations and then decision by the woman. Pink shading represents the probable outcomes or consequences of the decision-making which will include, women remaining central to decision-making thereby having more choices about their care and overall greater satisfaction with their labour and birth care. Staff will have greater job satisfaction and will feel valued and trusted.

Research on the impact of the recommendations will be imperative to offer health professionals an opportunity to reflect on the changes and review future planning.

**Figure 5.4: Decision-Making Pathway and Factors Influencing the Foetal Monitoring on Low Risk Labouring Women**





In summary, some recommendations pertaining to the clinical practice setting will take time and a coordinated planning effort to implement, other changes however can be implemented immediately, for example the immediate use of the Foetal Monitoring Decision-Making Pathway (Figure 5.3, page 150). Any promotion of change in practice requires effective communication and staff training and education about such changes will be imperative to their success.

### **Implications for Staff Training and Education**

Effective communication will be an integral part of implementing the recommendations to engage staff in change processes. With staff shortages and an ever-changing health environment in Queensland (Forster, 2005) it is important that managers and educators work together effectively to develop innovative training sessions that can be productive as well as a learning and interactive experience with colleagues. The following three recommendations were made relating to staff training and education from this study:

- The development of a theoretical decision-making pathway (similar to Figure 5.3) to integrate and promote client centred decision-making about foetal monitoring.
- Orientation for maternity staff on the scope of practice of obstetric medical officers and midwives to ensure clear role boundaries are established and to enable a foundation of professional trust.
- Facilitators of health education and training use Wood's ethical framework to promote the reflective practice of all clinicians working in the birth suite.

Multi-disciplinary orientation sessions would be one example of providing a way for medical officers and midwives to gain a greater understanding about each others' role and develop rapport with one another, prior to commencing duty within busy environments.

Furthermore, the development of a theoretical decision-making pathway (similar to Figure 5.3: A Sample Decision-Making Pathway about Foetal Monitoring, page 157) to integrate and promote client centred decision-making, could be undertaken as part of a multi-disciplinary workshop for health professionals working in birth suite. Wood's (2003) ethical framework could also be used to promote reflective thinking during the session. The pathway to promote *woman centred* decision-making and informed choice about foetal monitoring, that is developed by the staff during the workshop could then form the basis of policy and further training for others.

This scenario provides an example of a practical approach to address change, combine training and education and at the same time, develop or review a policy. Innovations such as this will ensure a strong linkage between the application of research and reflective practice to clinical practice. A range of further research has also recommended as a result of this study.

### **Implications for Further Research**

This study has recommended further research be undertaken to explore the impact of trust relationships on decision-making, particularly about the use of foetal monitoring. The current study identified Trust profoundly impacting on decision-making about foetal monitoring. This finding could be further tested to investigate the impact of trust on decision-making broadly. The literature review conducted in this study revealed limited research about this topic and it is anticipated that further knowledge in this area may help identify barriers experienced in the workplace, impacting on the implementation of evidence based clinical practice.

Further research is also recommended on the topic of clinical judgement in midwifery. Trust levels in one's own clinical judgement was also identified as a factor impacting on decision-making about foetal monitoring in labour. The more experienced midwives trusted in their clinical judgement and implemented clinical practice according to this clinical judgement, whereas the less experienced midwives practiced more according to policy. Further research to identify when and how clinical judgement is established in midwifery would add to our knowledge on midwives decision-making about foetal monitoring.

The finding that the less experience midwives reported on relying and trusting on policy to direct decision-making about foetal monitoring, could be another focus of future research. Perhaps, the less experienced midwives based decision-making on policy due to a higher regard for research compared to the more experienced midwives. This too, would add to the knowledge about midwives decision-making.

This qualitative GT study has enabled exploration and the identification of key factors impacting on midwives' clinical decision-making in relation to CEFM on low risk labouring women. Further study is recommended to verify or test aspects of the findings and also to gauge the usefulness of the recommendations. Research specific to each recommendation implemented would be imperative to gauge the impact on rates of CEFM. This may include the usefulness of Wood's reflective model in reducing rates of CEFM on low risk labouring women. Two staff groups could be examined and compared, one group of staff attending the education and training using Wood's reflective model and the other, attending standard updates on EBCPG and CEFM.

Further research would be required in the event of implementing a Decision Support System specific to foetal monitoring. Various aspects could be examined, for example, the opinions of staff towards using the system, a financial impact study could be carried out considering the cost of introducing the technology compared to rates of CEFM and medical intervention. The overall rates of CEFM would need to be identified.

Further research in particular, is recommended about rates of CEFM in low risk midwifery care models compared to standard low risk care. As discussed, a randomised control trial was conducted comparing standard care with Team Midwifery Care with rates of CEFM examined as one of the criteria (Biro et al., 2000). This study was however on a combination of low and high risk women, but could be used as a tool to replicate a further study specific to low risk women and the rate of CEFM.

In summary, further research is recommended to explore the impact of trust relationships and clinical judgement on decision-making, particularly about the use of foetal monitoring. Also, following the implementation of recommendations of this study further research is required to identify their impact on rates of CEFM on low risk labouring women.

### **Summary**

The study strengthens previous studies on trust, decision-making and recommendations for change within the birthing culture. In particular, this study supports the local recommendations made by Hirst (2005) for a major change in Queensland's culture pertaining to the delivery of maternity services. In the Re-Birthing Report, Hirst's recommendations include: Care belongs to consumers; Care is safe and feels safe, Care is open and honest, Care is local. Hirst's recommendations have been supported in

principle by Queensland Health, thereby enabling Queensland's public maternity service providers to implement community based, midwifery led, *woman centred*, models of care (Queensland Health, 2005). This study supports the implementation of these models in order to reduce the rates of CEFM on low risk labouring women and to build trusting relationships between women and health professionals and within the health environment itself. Moving maternity services to be mainly based in community settings will enhance the normality of childbearing and help to de-medicalise birthing.

Broad cultural changes in maternity services within Queensland will mean that midwives and medical officers working in maternity settings will experience many challenges and ongoing change. A supportive environment with open and honest management will promote a culture of trust within health organisations, further streamlining services and energising staff to work towards an improved model of working. The use of a Foetal Monitoring Decision-Making Pathway supported by a Decision Support System, combined with innovative training for staff about the use of foetal monitoring will work together in further reducing unnecessary use of CEFM.

In actioning the recommendation, over time, clinicians will have the opportunity to work in community based, midwifery led models in partnership with childbearing women during a normal part of their life cycle. Clinicians will build trust in policy documents and thereby increase their adherence to policy direction, whilst maintaining a *woman centred*, evidence based approach to decision-making. This will meet the women's needs for greater and informed choice during labour and birth and professional guidelines recommending client-focused care and use of evidence based practice, inclusive of clinical judgement.

**LIMITATIONS OF THIS RESEARCH**

Even though the research methods were applied rigorously, there remains to be some possible limitations to this research. The theoretical sampling process recruited five midwives who were perceived to monitor low risk labouring women with CEFM. The demographic range of clinical experience varied from vast experience (greater than ten years) to limited experience (less than two years). Having a midwife who had a medium level of experience may have enhanced the richness of the data by having maximum variation of the sample (Strauss & Corbin, 1998).

Observing the midwives during their clinical practice may have enhanced the study findings. Even though the chart audit process confirmed some aspects of the midwives' clinical practices, adding an observational component to the study would have ensured that the data collected from midwives during interviews was a reality of their clinical practice. This may have added greater richness to the study findings.

This study's broad range of recommendations responds to the study's findings from two urban hospital settings. While the recommendations are applicable to both of these settings, they are not generalisable to all maternity settings and should be examined for applicability to other maternity settings. For example, limitations would exist in applying some of these recommendations to small country hospitals, community birthing centres or tertiary hospitals. Further research is also recommended to evaluate the implementation of these strategies.

**CONCLUSION**

The labour and birth journey is a significant life event for a woman. Robust evidence has been shown to support IA for low risk labouring women during labour and a substantive theory of Midwives Decision-Making about CEFM, despite EBCPG was developed. Trust and workloads were found to have a major impact on midwives' decision-making on use of CEFM on low risk labouring women. Medical dominance and an environment based on risk management were also found to influence the environment in which midwifery care is delivered.

Study limitations have been outlined and recommendations made with a focus on reducing the rates of CEFM on low risk labouring women. These recommendations offer hope for a changing childbirth culture in Queensland and health organisations that are supportive and trust based. This will enhance the environments where women and their families are cared for, at such a precious stage of their life cycle.

---

## APPENDICES

### APPENDIX 1: DATA COLLECTION TOOL

#### **RESEARCH DATA COLLECTION: Electronic Fetal Monitoring in Labour**

Dear Colleagues,

Please complete details below of any client in labour encountering Electronic Fetal Monitoring by way of a CTG.

This includes:

Any admission CTG on a labouring woman,

Intermittent periods of CTG monitoring on a labouring woman, or

Continuous CTG monitoring on a labouring woman.

*Thankyou for your time and assistance.*

Janene

Date	UR Number	Birth Suite Room Number	Chart Whereabouts (once client discharged from Birth Suite)

Enquiries: Janene Rattray – Ext: 7676

Research Approval Numbers: RCHSD Ethics Committee – 04/Jun/26

ACU Human Research Ethics Committee – Q2003.04-18



---

## APPENDIX 2: PARTICIPANT LETTER & CONSENT



Australian Catholic University  
ABN 15 050 192 660  
Brisbane Campus  
1100 Nudgee Road Banyo  
Queensland 4014 Australia  
Telephone 073623 7100  
Facsimile 073623 7105  
[www.acu.edu.au](http://www.acu.edu.au)

### INFORMATION LETTER TO PARTICIPANTS

TITLE OF PROJECT:  
MIDWIVES' CLINICAL DECISION-MAKING &  
ELECTRONIC FETAL MONITORING.

NAMES OF STAFF SUPERVISORS:  
DR KAREN FLOWERS  
SANDRA MILES

NAME OF STUDENT RESEARCHER:  
JANENE RATTRAY

NAME OF PROGRAMME IN WHICH ENROLLED:  
MASTER OF MIDWIFERY (RESEARCH)

Dear Colleague,

The purpose of this study is to explore midwives' use of EFM in the care of labouring women, to better understand how clinical decisions are made.

As a midwife who has recently used EFM in your practice in birth suite you are invited to participate in an interview as part of the study. The interview will take approximately 40 minutes of your time.

The interview will be held in an office here within the hospital at a time suitable to you. With your permission the interview will be tape recorded and some brief notes will be taken. As the study progresses, you may also be contacted again to clarify particular points or issues.

The results of the study will be published in a thesis and later in professional journals. Your identity will remain confidential at all times. This means that your identity will not be revealed during the study or when the results are published.

Your participation in the study is voluntary and you are free to withdraw from the study at any time without consequence.

Should you wish to take part in the research, please complete the following consent forms, retain one for your own personal records and forward the other to:

Janene Rattray,  
Staff Development, Education & Training Unit,  
Caboolture Hospital.

---

*Please feel free to ask for further information or clarification on any matter regarding this project by contacting the Student Researcher:  
Janene Rattray, Clinical Lecturer in Midwifery on 3623 7329 or 3883 7676  
or the project supervisor:*

*Dr Karen Flowers, Senior Lecturer: 3623 7292  
School of Nursing  
Australian Catholic University  
1100 Nudgee Road  
Banyo. 4014.*

*This research project has been approved by the Human Research Ethics Committee at Australian Catholic University and by the Redcliffe-Caboolture Health Service District Ethics Committee.*

*In the event that you have any complaint or concern about the way you have been treated during the study, or if you have any query that the Supervisor and Student Researcher have not been able to satisfy, you may write to the Chair of the Human Research Ethics Committee care of the nearest branch of the Research Services Unit. Any complaint or concern will be treated in confidence and fully investigated. The participant will be informed of the outcome.*

QLD: Chair, HREC  
C/o Research Services  
Australian Catholic University  
Brisbane Campus  
PO Box 456  
Virginia QLD 4014  
Tel: 07 3623 7294  
Fax: 07 3623 7328

OR

District Manager  
Redcliffe-Caboolture Health Service District  
Locked Bag No. 1  
Redcliffe QLD 4020  
Tel: 07 3883 7523

Yours sincerely,

Janene Rattray

CONSENT FORM – Participant's copy

Australian Catholic University  
ABN 15 050 192 660  
Brisbane Campus  
1100 Nudgee Road Banyo  
Queensland 4014 Australia  
Telephone 073623 7100  
Facsimile 073623 7105  
[www.acu.edu.au](http://www.acu.edu.au)

TITLE OF PROJECT:  
MIDWIVES' CLINICAL DECISION-MAKING &  
ELECTRONIC FETAL MONITORING

NAME OF SUPERVISORs:  
DR KAREN FLOWERS  
SANDRA MILES

NAME OF STUDENT RESEARCHER:  
JANENE RATTRAY

I ..... (*the participant*) have read and understood the information provided in the Letter to Participants. Any questions I have asked have been answered to my satisfaction. I agree to participate in this activity, realising that the interview will be audio-taped and that I can withdraw at any time. I agree that research data collected for the study may be published or may be provided to other researchers in a form that does not identify me in any way.

NAME OF PARTICIPANT: .....  
(block letters)

SIGNATURE ..... DATE .....

SIGNATURE OF:  
RESEARCHER

.....

---

CONSENT FORM – Researcher's copy

TITLE OF PROJECT:  
MIDWIVES' CLINICAL DECISION-MAKING &  
ELECTRONIC FETAL MONITORING

NAME OF SUPERVISORs:  
DR KAREN FLOWERS  
SANDRA MILES

NAME OF STUDENT RESEARCHER:  
JANENE RATTRAY

I ..... (*the participant*) have read and understood the information provided in the Letter to Participants. Any questions I have asked have been answered to my satisfaction. I agree to participate in this activity, realising that the interview will be audio-taped and that I can withdraw at any time. I agree that research data collected for the study may be published or may be provided to other researchers in a form that does not identify me in any way.

NAME OF PARTICIPANT: .....  
(block letters)

SIGNATURE ..... DATE .....

SIGNATURE OF:  
RESEARCHER

.....

---

## APPENDIX 3: ETHICS APPROVAL

Australian Catholic University  
Brisbane Sydney Canberra Ballarat Melbourne



---

### Human Research Ethics Committee

#### Committee Approval Form

Principal Investigator/Supervisor: Dr Karen Flowers Brisbane Campus  
Co-Investigators: Ms Sandra Miles Brisbane Campus  
Student Researcher: Ms Janene Rattray Brisbane Campus

Ethics approval has been granted for the following project:  
Midwives' Clinical Decision Making and Electronic Fetal Monitoring  
for the period: 8<sup>th</sup> June 2004 - 31 December 2004  
Human Research Ethics Committee (HREC) Register Number: Q2003.04-18

The following standard conditions as stipulated in the *National Statement on Ethical Conduct in Research Involving Humans* (1999) apply:

- (i) that Principal Investigators / Supervisors provide, on the form supplied by the Human Research Ethics Committee, annual reports on matters such as:
  - security of records
  - compliance with approved consent procedures and documentation
  - compliance with special conditions, and
- (ii) that researchers report to the HREC immediately any matter that might affect the ethical acceptability of the protocol, such as:
  - proposed changes to the protocol
  - unforeseen circumstances or events
  - adverse effects on participants

The HREC will conduct an audit each year of all projects deemed to be of more than minimal risk. There will also be random audits of a sample of projects considered to be of minimal risk on all campuses each year.

Within one month of the conclusion of the project, researchers are required to complete a *Final Report Form* and submit it to the local Research Services Officer.

If the project continues for more than one year, researchers are required to complete an *Annual Progress Report Form* and submit it to the local Research Services Officer within one month of the anniversary date of the ethics approval.

Signed: B. Lucas Date: 9.06.2004  
(Research Services Officer, McAuley Campus)





Queensland  
Government

**REDCLIFFE-CABOOLTURE HEALTH SERVICE DISTRICT  
ETHICS COMMITTEE**

Queensland Health

Inquiries to: Mr M Zgrajewski  
Chairperson  
Telephone: (07) 3883 7851  
Facsimile: (07) 3883 7530  
Our Reference: MZ:md/mr/cl

15<sup>th</sup> June 2004

Janene Rattray  
Australian Catholic University  
PO Box 456  
VIRGINIA Q 4014

Dear Janene,

**Re: Redcliffe Approval No: 04/Jun/26  
MIDWIVES' DECISION MAKING PROCESSES AND ELECTRONIC FETAL MONITORING**

Please be aware of the following changes/enquiries to the **proposal** for the above study. These changes were requested by the Redcliffe-Caboolture Health Service District Ethics Committee at the meeting of **9<sup>th</sup> June 2004**.

- On page 3 of the proposal under the heading 'Data Collection', '**auditing**' is misspelt;
- Also on page 3 of the proposal, the Members have requested clarification of the second (attachment highlighted) paragraph.

As per normal procedure, these documents do not need to be re-approved by the Committee, but the activated changes need to be reviewed and will be represented at the next meeting, for the Members' acknowledgement.

If you have any concerns or complaints in regards to the Ethics Committee's decision, please contact the Chairperson, **Mr Mark Zgrajewski**, via the secretary, on (07)3883 7851 or the **District Manager's** office on (07)3883 7523.

Kind Regards,

*M. Duroux*

**Maree Duroux//Megan Ratcliffe/Cathy Larter  
SECRETARY**

**REDCLIFFE-CABOOLTURE HEALTH SERVICE DISTRICT  
ETHICS COMMITTEE**

**Office**  
Ethics/Research Office  
Level 2  
Redcliffe Hospital  
Anzac Avenue  
REDCLIFFE Q 4020

**Postal**  
Secretary  
Redcliffe-Caboolture Health  
Service District  
Ethics Committee  
Locked Mail Bag No 1  
REDCLIFFE Q 4020

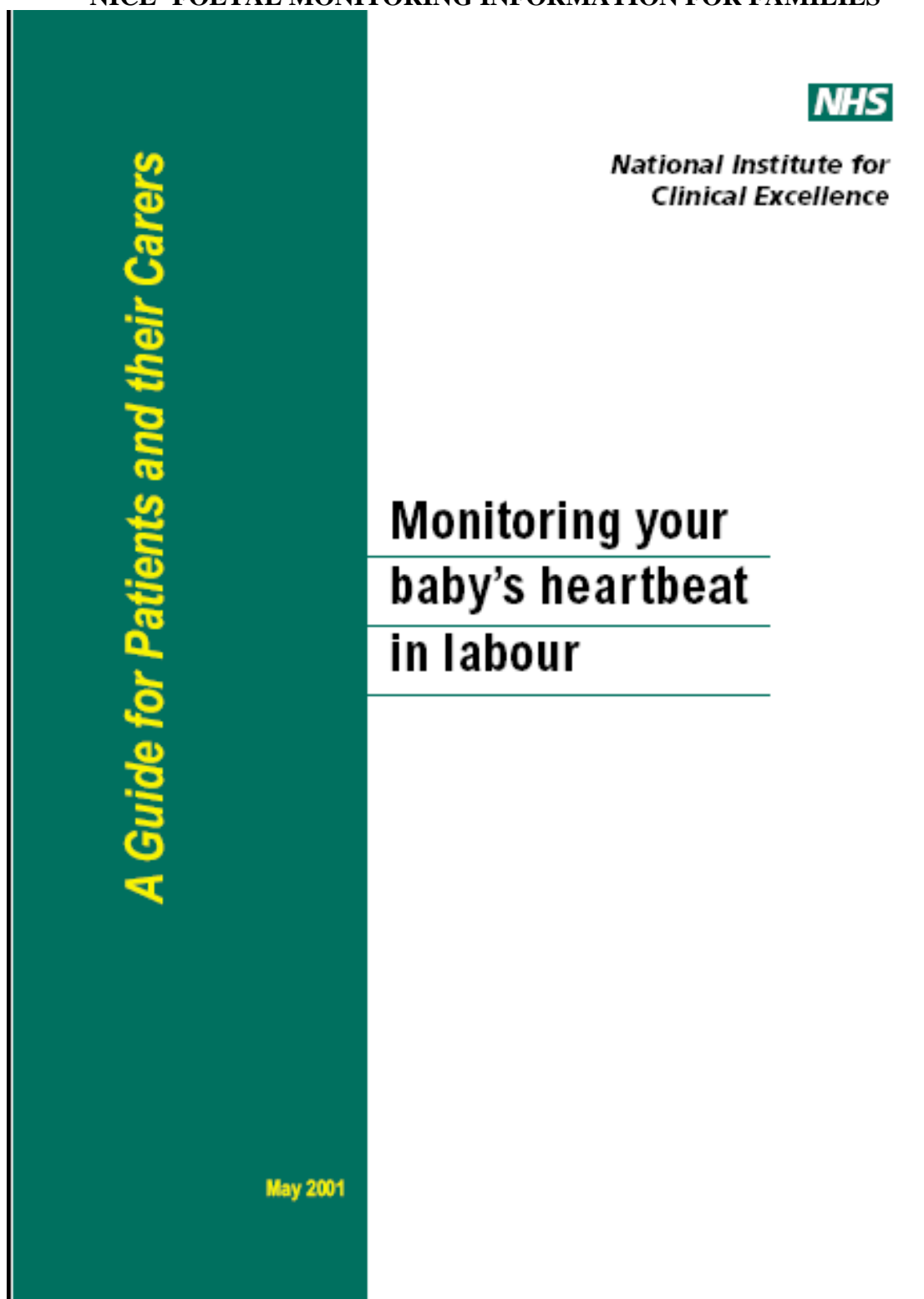
**Phone**  
Dect phone  
Direct Line  
(07) 3883 7199

**Fax**  
Office  
(07) 3883 7530

---

**APPENDIX 4:**

**‘NICE’ FOETAL MONITORING INFORMATION FOR FAMILIES**



---

**A Guide for pregnant women, their partners and their families**

**Monitoring your baby's heartbeat in labour**

Issue date: May 2001  
Review date: March 2003

**Ordering information**

The full guidance issued to the NHS is available from the NICE website ([www.nice.org.uk](http://www.nice.org.uk)). Copies can also be obtained by contacting the NHS Response Line on 0870 1555 455 and quoting ref. no. 23807.

***National Institute for  
Clinical Excellence***

11 Strand  
London  
WC2N 6HR

Web: [www.nice.org.uk](http://www.nice.org.uk)

ISBN: 1-84257-103-6  
Published by the National Institute for Clinical Excellence  
May 2001

© Copyright National Institute for Clinical Excellence 2001. All rights reserved. This material may be freely reproduced for educational and not for profit purposes within the NHS. No reproduction by or for commercial organisations is permitted without the express written permission of the Institute.

23810 1k 1P May 01 (ABA)



---

Contents	page
About this booklet	2
About clinical guidelines	2
Why monitor a baby's heartbeat in labour?	3
What are the methods for fetal heart monitoring?	3
Continuous monitoring with an Electronic Fetal Heart Monitor	4
What happens if a problem is suspected?	7
Further information	7
Acknowledgements	8

---

### About this booklet

- Is for pregnant women, their partners and their families.
- Gives information to help you make choices about how your baby's heartbeats are monitored during labour.
- Gives information on how doctors and midwives monitor babies' heartbeats during labour in hospital.
- Is based on a national evidence based clinical guideline on Electronic Fetal Monitoring.

### About clinical guidelines

Clinical guidelines are recommendations for good practice and exist to help patients and their healthcare team make the right decisions about health care. The guidelines are developed by teams of healthcare professionals, patients and scientists who look at the best evidence about care for a particular condition.

The advice in this booklet is adapted from a guideline produced by the Royal College of Obstetricians and Gynaecologists (RCOG) on behalf of the National Institute for Clinical Excellence (NICE) for the NHS in England and Wales.

Everyone has the right to be fully informed and to share in decision-making about health care. Health care staff should respect and take into account the wishes of the people in their care. Guidelines are recommendations for good practice. There may be good reasons why your treatment differs from the recommendations in this booklet, depending on your individual circumstances and wishes.

**Why  
monitor a  
baby's  
heartbeat in  
labour?**

The National Institute for Clinical Excellence (NICE) is a part of the NHS. It produces guidance for both the NHS and patients on medicines, medical equipment and clinical procedures and where they should be used.

If you go into hospital to give birth, various checks will be offered to you and your unborn baby. This will include listening to, or monitoring your baby's heartbeat.

Most babies come through labour without problems but there are a few who don't cope so well. During contractions blood can't get through the placenta (afterbirth) so easily. This is normal and most babies cope without any problems. If a baby is not coping well, this may be reflected in the pattern of their heartbeat.

**What are  
the  
methods for  
fetal heart  
monitoring?**

One of the best ways of finding out if your baby is having difficulties is to listen to their heartbeat regularly throughout the labour. This is known as Fetal Heart Monitoring.

Your baby's heartbeat can be monitored in a number of different ways which are explained on the following pages.

Your baby's heart rate can be measured either at regular intervals ('intermittent auscultation') or continuously (electronic fetal monitoring). Before starting any monitoring the midwife or doctor will listen to your heartbeat as well as your baby's heart to make sure they can tell them apart.

**Intermittent auscultation (with a Pinard stethoscope or a hand held “Doppler”):**

If you are healthy and have had a trouble-free pregnancy this is the recommended method of monitoring your baby’s heartbeat during labour. This should happen every fifteen minutes during the early stages of labour, increasing to once every five minutes (or once every contraction) in the later stages.

Current research evidence does not support the need for your baby’s heartbeat to be monitored using an electronic fetal heart monitor when you arrive at the hospital.

Intermittent Auscultation can be done using either a Pinard stethoscope, or a hand held ‘Doppler’. A Pinard is a trumpet shaped stethoscope. It enables your doctor or midwife to hear your baby’s heartbeat through your abdomen (tummy). A ‘Doppler’ is a small hand held device which looks like microphone. When it is placed against your abdomen it allows you, your midwife and your doctor to listen to your baby’s heartbeat using Doppler USS.

With intermittent monitoring, your ability to move around will only be limited when the baby’s heartbeat is being listened to. At other times you will be able to stand up and move around.

**Continuous monitoring with an Electronic Fetal Heart Rate Monitor**

Sometimes your midwife or doctor may offer and recommend continuous monitoring. This may be for a number of reasons relating to you or your baby’s health. The reasons for using continuous monitoring should be discussed between you, your midwife and/or your doctor. For example:

- Your midwife or doctor has already listened to your baby's heartbeat using a Pinard stethoscope or 'Doppler' and thinks that your baby may not be coping well.
- You have a health problem such as:
  - Diabetes
  - Infection
  - Pre eclampsia (high blood pressure)
  - Problems with your heart or kidneys
- Factors relating to your current or a previous pregnancy such as:
  - Your pregnancy has lasted more than 42 weeks
  - You are having Epidural analgesia (pain relief injected into the back)
  - You have had bleeding from your vagina during or before labour
  - Your labour is induced (started artificially) or strengthened with a drip (oxytocin)
  - You have a twin/triplet pregnancy.
  - You have previously had Caesarean Section
  - Your baby is small or premature
  - Your baby is a breech presentation (going to be born bottom first)

You may wish to have continuous monitoring for your own reasons.

Continuous monitoring keeps track of your baby's heartbeat for the whole of your labour. This is done using a piece of equipment called an electronic fetal heart rate monitor which records your baby's heartbeat.

---

Usually elastic belts are used to hold sensors against your abdomen. These sensors detect your baby's heartbeat and are connected to the monitor.

The monitor records your baby's heartbeat as a pattern on a strip of paper. This is sometimes called a "trace" or a "CTG".

Your midwife or doctor will read and interpret the trace to help get an idea of how well your baby is coping with labour. It is normal for there to be changes in the pattern of the heartbeat, for example, when your baby is sleeping or moving around.

You should ask your midwife or doctor if you want the trace explained to you.

Being attached to the monitor can limit your ability to move around. Whilst it may be okay to stand up or sit down, it will not be possible to have a bath or move from room to room.

Occasionally a Fetal Scalp Electrode (sometimes called a "clip") may be offered and recommended. The reasons for doing this should be discussed with you. The electrode picks up your baby's heartbeat directly. It is attached to your baby's scalp through the vagina and is then connected to the monitor.

The trace may make your midwife or doctor suspect that your baby is not coping well. If this happens, further action may be taken. This could include immediate delivery of your baby or carrying out a further test called Fetal Blood Sampling.

---

**What happens if a problem is suspected?**

Occasionally the trace can make your midwife or doctor suspect that your baby is not coping well when in fact they are fine. Fetal blood sampling can help to clarify this and may avoid you having an unnecessary Caesarean Section. Compared with the monitor alone, it is a more accurate way of checking if your baby is not coping well.

Fetal blood sampling involves taking one or two drops of blood from your baby's scalp (through your vagina). This blood is tested for oxygen levels to show if your baby is not coping well with labour. The test can take between ten and twenty minutes.

There may be reasons why fetal blood sampling is not appropriate for you, for example if you have certain infections. Your midwife or doctor should discuss this with you.

For further information about fetal monitoring, and all other aspects of pregnancy and childbirth, talk to your midwife or doctor.

Everyone has the right to be fully informed and to share in decision-making about health care. You can discuss this guideline with your midwife or doctor. If you have access to the internet and would like to find out more about childbirth, visit the NHS Direct website [www.nhsdirect.nhs.uk](http://www.nhsdirect.nhs.uk) or telephone NHS Direct on 0845 4647.

---

**Further Information**

For further information about NICE, the Clinical Guidelines Programme or other versions of this guideline (including the sources of evidence) you can visit the NICE website at [www.nice.org.uk](http://www.nice.org.uk). Full copies of the NICE guideline can be requested from 0870 1555 455, quoting the reference number 23807.

---

For other versions of the Clinical Guideline including sources of evidence for the recommendations made in this booklet contact The Clinical Effectiveness Support Unit, The Royal College of Obstetricians and Gynaecologists (RCOG) [www.rcog.org.uk](http://www.rcog.org.uk) or [efm@rcog.org.uk](mailto:efm@rcog.org.uk).

#### **Acknowledgements**

This patient information was developed with help from the Centre for Health Information Quality, Help for Health Trust (website [www.hfht.org/chiq](http://www.hfht.org/chiq) or e-mail [chiq@hfht.org](mailto:chiq@hfht.org)).

MIDIRS (July 1996) "Listening to your baby's heartbeat during labour" - one of the Informed Choice Series of information leaflets.



---

## **REFERENCE LIST**

- Australian College of Midwives Incorporated. (2001). *Code of ethics*. Retrieved October 29, 2005, from Web site: <http://www.acmi.org.au>.
- Australian College of Midwives Incorporated. (2004). *National midwifery guidelines for consultation and referral*. Retrieved October 29, 2005, from Web site: <http://www.acmi.org.au>.
- Allen, J. (2002). *Doulas create birth memories worth cherishing*. Retrieved August 10, 2006, from Web site: <http://www.cwhn.ca/resources/kickers/doulas.pdf>
- American College of Obstetrics & Gynaecology. (1995). Foetal heart rate patterns: monitoring, interpretation and management. *Technical Bulletin*, 207. Washington DC.
- Banta, B., & Thacker, S. (2001). Historical controversy in health technology assessment: the case of electronic foetal monitoring. *Obstetrical & Gynaecological Survey*, 56(11), 707–719. Retrieved March 26, 2002, from Ovid database.
- Benner, P. (1984). *From novice to expert: promoting power, excellence and pioneer in clinical nursing practice*. Menlo Park: Addison-Wesley.
- Benoliel, J. (1996). Grounded theory and nursing knowledge. *Qualitative Health Research*, 6(3), 406–428.
- Berggren, A. (1996). Swedish midwives' awareness of, attitudes to and use of selected research findings. *Journal of Advanced Nursing*, 23(3), 462–470. Retrieved May, 2003, from Ovid database.
- Biro, M., Waldenstrom, U., & Pannifex, J. (2000). Team midwifery care in a tertiary level obstetric service: a randomized controlled trial. *Birth*, 27, 168–173.
- Blix, E., Sviggum, O., Koss, K. & Oian, P. (2003). Inter-observer variation in assessment of 845 labour admission tests: comparison between midwives and obstetricians in the clinical setting and two experts. *BJOG*, 110, 1–5.
- Brodie, P., & Barclay, L. (2001). Contemporary issues in Australian midwifery regulation. *Australian Health Review*, 24(4), 103–118.
- Buckingham, C., & Adams, A. (2000). Classifying clinical decision-making: interpreting nursing intuition, heuristics and medical diagnosis. *Journal of Advanced Nursing*, 32(4), 990–998.
- Butterworth, T., & Bishop, V. (1995). Identifying the characteristics of optimum practice: findings from a survey of practice experts in nursing, midwifery and health visiting. *Journal of Advanced Nursing*, 22(1), 24–32.

- 
- Cioffe, J., & Markham, R. (1997). Clinical decision-making by midwives: managing case complexity. *Journal of Advanced Nursing*, 25(2), 265–272. Retrieved April 4, 2003, from Ovid database.
- Davies, B., Hodnett, E., Hannah, M., & O'Brien-Pallas, L. (2002). Foetal health surveillance: a community-wide approach versus a tailored intervention for the implementation of clinical practice guidelines. *Canadian Medical Association*, 167(5), 469–74.
- de Raeve, L. (2002). Trust and trustworthiness in nurse-patient relationships. *Nursing Philosophy*, 3(2), 152–162.
- DeBourgh, G. 2001. Champions for evidence-based practice: a critical role for advanced practice nurses. *AACN Clinical Issues*, 12(4), 491–508.
- Denzin, N., & Lincoln, Y. (2003). *Strategies of qualitative inquiry*. Thousand Oaks: Sage Publications.
- Devoe, L., Golde, S., Kilman, Y., Morton, D., Shea, K., & Waller, J. (2000). A comparison of visual analyses of intrapartum foetal heart rate tracings according to the new national institute of child health and human development guidelines with computer analyses by an automated foetal heart rate monitoring system. *American Journal of Obstetrics & Gynecology*, 183(2), 361–366.
- Dover, S., & Gauge, S. (1995). Foetal monitoring – midwifery attitudes. *Midwifery*, 11, 18–27.
- Dowding, D., & Thompson, C. (2003). Measuring the quality of judgement and decision-making in nursing. *Journal of Advanced Nursing*, 44(1), 49–57.
- Duffy, K., Ferguson, C., & Watson, H. (2004). Data collecting in grounded theory – some practical issues. *Nurse Researcher*, 11(4), 67–78.
- Edmonds, K. (1999). *Dewhurst's textbook of obstetrics and gynaecology for postgraduates*. Edinburgh: Blackwell.
- Feinstein, N., Sprague, A., & Trepanier, M. (2000). Foetal heart rate auscultation: comparing auscultation to electronic foetal monitoring. *AWHONN Lifelines*, 4(3), 35–44. Retrieved April 12, 2004, from Ovid database.
- Felix, K. (1997). Developing trust in teams within health care organizations surviving in dynamic environments. *University of Colorado Health Sciences Centre*. Retrieved August 8, 2005, from Ovid database.
- Flood-Chez, B., Harvey, M., & Harvey, C. (2000). Intrapartum foetal monitoring: past, present and future. *Journal of Perinatal and Neonatal Nursing*, 14(3), 1-18.
- Foley, L., & Faircloth, C. (2003). Medicine as discursive resource: legitimization in the work narratives of midwives. *Sociology of Health & Illness*, 25(2), 165-184.
- Forster, P. (2005). Queensland health systems review. Retrieved 2005, from Web site: [www.health.qld.gov.au](http://www.health.qld.gov.au).
-

- 
- Fraser, D., & Cooper, M. (2003). *Myles textbook for midwives*. Nottingham: Churchill Livingstone.
- Glaser, B. & Strauss, A. (1967). *The discovery of Grounded Theory –strategies for qualitative research*. New York: Aldine De Gruyter.
- Goddard, R. (2001). Electronic foetal monitoring: is not necessary for low risk labours. *British Medical Journal*, 322(7300), 1436–1437.
- Grbich, C. (1999). *Qualitative research in health: An introduction*. Sydney: Allen & Unwin.
- Goodwin, L. (2000). Intermittent auscultation of the foetal heart rate: a review of general principles. *Journal of Perinatal Nursing*, 14(3), 53–61.
- Greenhalgh, T. (1997). Papers that summarise other papers (systematic review and meta-analyses). *British Medical Journal*, 315, 672–675.
- Guilliland, K., & Pairman, S. (1995). *The midwifery partnership: a model for practice*. Wellington: Department of Nursing & Midwifery, Victorian University of Wellington.
- Gustafsson, C., & Fagerberg, I. (2004). Reflection, the way to professional development? *Journal of Clinical Nursing*, 13(3), 271–280. Retrieved October 29, 2006, from Web site: <http://gateway.ut.ovid.com.ezproxy2.acu.edu.au/gw1/ovidweb.cgi>
- Haggerty, L. (1996). Assessment parameters and indicators in expert intrapartum nursing decisions. *JOGNN*, 25(6), 491–499.
- Haggerty, L. (1999). Continuous electronic foetal monitoring: contradictions between practice and research. *JOGNN*, 28(4), 409–416.
- Hall, J. (2001). *Midwifery, mind & spirit*. Melbourne: Books for Midwives.
- Hicks, C., & Hennessy, D. (1997). Mixed messages in nursing research: their contribution to the persisting hiatus between evidence and practice. *Journal of Advanced Nursing*, 25(3), 595–601.
- Hindley, C. (2001). Intrapartum electronic foetal monitoring in low-risk women: a literature review. *Journal of Clinical Excellence*, 3, 91–99.
- Hirst, C. 2005. *Report of the Review of Maternity Services in Queensland*. Retrieved May, 2005, from Web site: <http://www.health.qld.gov.au/maternity/rebirthing.asp>
- Hoerst, B., & Fairman, J. (2000). Social and professional influences of the technology of electronic foetal monitoring on obstetrical nursing. *Western Journal of Nursing Research*, 22(4), 475–491.

- 
- Hoffman, K., Donoghue, J., & Duffield, C. (2004). Decision-making in clinical nursing: investigating contributing factors. *Journal of Advanced Nursing*, 45(1), 53–62.
- Hodgkinson, B., Evans, D., & O'Neill, S. (2000). Knowledge retention from pre-operative patient information. *The Joanna Briggs Institute for Evidence Based Nursing and Midwifery*, 4(6), 1-6.
- Homer, C., Brodie, P., & Leap, N. (2001). *Establishing models of continuity of midwifery care in Australia, a resource for midwives & managers*. Centre for Family Health & Midwifery. Sydney.
- Hyde, A., & Roche-Reid, B. (2004). Midwifery practice and the crisis of modernity: implications for the role of the midwife. *Social Science Medicine*, 58(12), 2613–23.
- Impey, L., Reynolds, M., MacQuillan, K., Gates, S., Murphy, J., & Sheil, O. (2003). Admission cardiotocography: a randomised controlled trial. *The Lancet*, 361(9356), 465–470.
- Johanson, R., Newburn, M., & Macfarlane, A. (2002). Has the medicalisation of childbirth gone too far? *British Medical Journal*, 324(7342), 892–895.
- Johnson, N. (2002). Guidelines on using guidelines, *BJOG: An International Journal of Obstetrics & Gynaecology*, 109, 495–497.
- Kajermo, K., Nordstrom, G., Krusebrant, A., & Bjorvell, H. (1998). Barriers to and facilitators of research utilization, as perceived by a group of registered nurses in Sweden. *Journal of Advanced Nursing*, 27(4), 798–807.
- Kanagaratnam, T. (1995). Coconut belly rubs: traditional midwifery care in Malaysia & Indonesia. *International Midwife*, 3. Retrieved July, 6. 2005, from Web site: <http://www.childbirthsolutions.com/articles/worldbirth/malaysia-indonesia/index.php>
- Kawamoto, K., Houlihan, C., Balas, E., & Lobac, D. (2005). Improving clinical practice using clinical decision support systems: a systematic review of trials to identify features critical to success. *British Medical Journal*, 330, 765.
- Kennedy, G. (1998). Electronic fetal heart rate monitoring: retrospective reflections on a twentieth-century technology. *Journal of the Royal Society of Medicine*, 91, 244 – 250. Retrieved February, 23, 2007, from PubMed database.
- Kraetschmer, N., Sharpe, M., Urowitz, S., & Deber, R. (2004). How does trust affect patient preferences for participation in decision-making? *Health Expectations*, 7(9), 317–326. Retrieved August, 1, 2005, from Blackwell Publishing Ltd database.
- Kripke, C. (1999). Why are we using electronic foetal monitoring? *American Family Physician*, 59(9), 2416–2422.
-

- 
- Lauri, S., Salantera, S., Chalmers, K., Ekman, S., Kim, H., Kappeli, S., & MacLeod, M. (2001). An exploratory study of clinical decision-making in five countries. *Journal of Nursing Scholarship*, 33(1), 83–90.
- Levy-Shiff, R., Lerman, M., Har-Even, D., & Hod, M. (2002). Maternal adjustment and infant outcome in medically defined high risk pregnancy. *Developmental Psychology*, 38(1), 93–103.
- Levy, V. (1999). Midwives, informed choice and power: part 1. *British Journal of Midwifery*, 7(9), 583–586.
- Lewis, L., & Rowe, J. (2004a). Moving with the beat: changing foetal monitoring practices in low-risk labour. *Australian Midwifery Journal*, 17(1), 23–29.
- Lewis, L., & Rowe, J. (2004b). Focus on the beat: current foetal monitoring practice in low-risk labour. *Australian Midwifery Journal*, 17(4), 6–10.
- McIntosh, J. (1995). Barriers to research implementation. *Nurse Researcher*, 2(4), 83–91.
- MacLennan, A. (2001). A guest editorial from abroad: medico legal opinion – time for peer review. *Obstetric & Gynecological Survey*, 56(3), 121–123. Retrieved March, 2004, from Ovid database.
- Mahlmeister, L. (2000). Legal implications of foetal heart assessment. *JOGNN*, 29(5), 517–526.
- Malloch, K. (2002). Trusting organizations: describing and measuring employee to employee relationships. *Nursing Administration*, 26(3), 12–19.
- Mason, J. (1996). *Qualitative researching*. London: SAGE Publications.
- McCallin, A. (2001). Interdisciplinary practice – a matter of teamwork: an integrated literature review. *Journal of Clinical Nursing*, 10(4), 419–428.
- McCaughan, D., Thompson, C., Cullum, N., Sheldon, A., & Thompson, D. (2002). Acute care nurses' perceptions of barriers to using research information in clinical decision-making. *Journal of Advanced Nursing*, 39(1), 46–60.
- McRae, M. (1993). Litigation, electronic foetal monitoring, and the obstetric nurse. *JOGNN*, 22(5), 410–419.
- Meah, S., Luker, K., & Cullum, N. (1996). An exploration of midwives' attitudes to research and perceived barriers to research utilisation. *Midwifery*, 12, 73–84.
- Minichiello, V., Aroni, R., Timewell, E., & Alexander, L. (1995). *In-depth interviewing*. Melbourne: Longman Australia.
- Mires, G., Williams, F., Howie, P., Goldbeck-Wood, S., et al. (2001). Randomised controlled trial of cardiotocography versus doppler auscultation of foetal heart at admission in labour in low risk obstetric population. *British Medical Journal*, 322(7300), 1457–1462. Retrieved May, 2002, from ProQuest database.
-

- 
- Morrison, J., Chez, B., Davis, I., Martin, R., Roberts, W., Martin, J., & Floyd, R. (1993). Intrapartum foetal heart rate assessment: monitoring by auscultation or electronic means. *American Journal of Obstetrics & Gynecology*, 168(1), 63–66.
- National Institute for Health & Clinical Excellence. (2001). *Monitoring you baby's heartbeat in labour – a guide for patients and their carers*. Retrieved from Web site: [www.nice.org.uk](http://www.nice.org.uk)
- National Institute for Health & Clinical Excellence. (2001). *The use of foetal monitoring*. Inherited Clinical Guideline C. National Institute for Health & Clinical Excellence: London.
- NHS Centre for Reviews and Dissemination, (1999). Getting evidence into practice. *Effective Health Care*, 5(1), 1–16.
- Olds, S., London, M., & Ladewig, P. (2000). *Maternal newborn nursing*. (6<sup>th</sup> ed.). New Jersey: Prentice Hall Health.
- Ottani, P. (2001). When childbirth preparation isn't a cultural norm. Retrieved August 10, 2006, from Web site: <http://www.icea.org/0602.pdf>
- Page, L. (2000). *The new midwifery*. London: Churchill Livingstone.
- Parer, J., & King, T. (2000). Foetal heart rate monitoring: Is it salvageable? *American Journal of Obstetrics and Gynaecology*, 182(4), 982–987. Retrieved December, 2002, from Ovid database.
- Parer, J. (2003). Electronic Foetal heart rate monitoring: a story of survival. *Obstetrical & Gynaecological Survey*, 58(9), 561–563.
- Pask, E. (1995). Trust: an essential component of nursing practice – implications for nurse education. *Nurse Education Today*, 15, 190–195.
- Perinatal Statistics – Queensland. (2000). Mothers delivering in Queensland, 2000 Selected procedures and operations performed. Retrieved June, 2003, from Queensland Health Web site: [www.health.qld.gov.au/hic/peri2000/Lab&del\\_1.pdf](http://www.health.qld.gov.au/hic/peri2000/Lab&del_1.pdf)
- Perlman, J. (1997). Intrapartum hypoxic-ischemic cerebral injury and subsequent cerebral palsy: medico legal issues. *Paediatrics*, 99(6), 851 – 859.
- Polit, D. (2006). *Essentials of nursing research: methods, appraisal, and utilization*. Philadelphia: Lippincott Williams & Wilkins.
- Queensland Government. (1995). *Workplace Health & Safety Act 1995*. Retrieved November, 18, 2006 from Web site: <http://www.legislation.qld.gov.au/LEGISLTN/CURRENT/W/WorkplHSaA95.pdf>
- Queensland Health. (2006). *Code of conduct*. Retrieved May 10, 2006, from Web site: [http://www.health.qld.gov.au/about\\_qhealth/cc2006web.pdf](http://www.health.qld.gov.au/about_qhealth/cc2006web.pdf)

- 
- Queensland Health. (2005). Recommendations, strategies and actions and government response. Retrieved, 2005, from Web site: [www.health.qld.gov.au](http://www.health.qld.gov.au).
- Queensland Health. (2004). *Redcliffe-Caboolture health services district quarterly activity service profile, maternity & gynaecology services*. Redcliffe: Safety Quality & Performance.
- Queensland Health. (2002). *Your rights and responsibilities, Queensland health public patient's charter*. Brisbane.
- Queensland Nursing Council. (2000). *Code of practice for midwives*. Retrieved June, 2003, from Web site: [www.qnc.qld.gov.au](http://www.qnc.qld.gov.au)
- Queensland Nursing Council. (2005). Scope of practice framework for Nurses & Midwives. Retrieved June, 2005, from Web site: [www.qnc.qld.gov.au](http://www.qnc.qld.gov.au)
- Royal Australian & New Zealand College of Obstetrics & Gynaecology, (2006). Intrapartum foetal surveillance, Clinical guidelines – Summary of guidelines and good practice notes. Retrieved October, 2006, from Web site: <http://www.ranzcog.edu.au/publications/womenshealth.shtml#IFSG>
- Rees, C. (1997). *An introduction to research for midwives*. Chesire: Books for Midwives Press.
- Richens, Y. (2002). Are midwives using research evidence in practice? *British Journal of Midwifery*, 10(1), 11–16.
- Robrecht, L. (1995). Grounded Theory: evolving methods. *Qualitative Health Research*, 5(2), 169–177.
- Royal College of Obstetricians & Gynaecologists. (2001). *The use of electronic foetal monitoring - evidence-based clinical guideline number 8*. London: Press.
- Saxina, P. (2006). *Why birth interventions are on the rise*. RxPG News. Retrieved November 18, 2006, from Web site: [http://www.rxpgnews.com/research/obstetrics/article\\_4538.shtml](http://www.rxpgnews.com/research/obstetrics/article_4538.shtml)
- Schramm, W., Barnes, D., & Bakewell, J. (1987). Neonatal mortality in Missouri home births, 1978 – 84. *American Journal of Public Health*, 77(8), 930–935.
- Schwartz-Barcott, D., Patterson, B., Lusardi, P., & Farmer, B. (2002). From practice to theory: tightening the link via three fieldwork strategies. *Journal of Advanced Nursing*, 39(3), 281–289.
- Selinger, R. (2004). It's more than a matter of trust. *Health Management Technology*, 24(10), 82–84.
- Sharma, S., Downey, G., & Heywood, R. (2002). Guidelines: are they adhered to in clinical practice? *Journal of Clinical Governance*, 10(2), 71–75.

- 
- Sinclair, M. (2001). Midwives' attitudes to the use of the cardiotocograph machine. *Journal of Advanced Nursing*, 35(4), 599–606. Retrieved December, 2002, from Ovid database.
- Skodol Wilson, H., & Ambler Hutchinson, S. (1996). Methodologic mistakes in Grounded Theory. *Nursing Research*, 45(2), 122–124.
- Society of Obstetricians & Gynaecologists of Canada. (2002). Clinical Practice Guidelines. Policy statement no. 44. Retrieved March, 2004, from Web site: <http://www.sogc.org/guidelines/public/112E-CPG1-March2002.pdf>
- Strauss, A., & Corbin, J. (1998). *Basics of qualitative research – techniques and procedures for developing Grounded Theory*. London: SAGE Publications.
- Stringer, E. (1999). *Action Research*, London: Sage Publications.
- Supplee, R., & Vezeau, T. (1996). Continuous electronic foetal monitoring: does it belong in low –risk births? *The American Journal of Maternal/Child Nursing*, 21(6), 301–306.
- Taylor, A. (2001). On changing the social relations of Australian childbirth: a cautionary note. *The International Journal of Health Sociology: policy, promotion, equity & practice*. Retrieved June 8, 2006, from Web site: <http://hsr.e-contentmanagement.com>
- Thacker, S., Stroup, D., & Chang, M. (2003). Continuous electronic heart rate monitoring for foetal assessment during labour. *The Cochrane Library*, Issue 1, 2003. Oxford: Update Software.
- Thacker, S., Stroup, D., & Peterson, H. (1998). Intrapartum electronic foetal monitoring: data for clinical decisions. *Clinical Obstetrics & Gynaecology*, 41(2), 362–368.
- Thorstensen, K. (2000). Trusting women: essential to midwifery. *Journal of Midwifery & Women's Health*, 45(5), 405–407.
- Tucker, J., Parry, G., Penney, G., Page, M., & Hundley, V. (2003). Is midwife workload associated with quality of process of care (CEFM) and neonatal outcome indicators? A prospective study in consultant-led labour wards in Scotland. *Paediatric & Perinatal Epidemiology*, 17, 369–377.
- Walker, R. (2001). Trust between primary health care organisations. *Health Promotion Journal of Australia*, 11(1), 43–47.
- Walker, R., Turnbull, D., & Wilkinson, C. (2004). Increasing caesarean section rates. Exploring the role of culture in an Australian community. *Birth*, 31(2), 117–124.
- Weaver, E., Clark, K., & Vernon, B. (2005). Obstetricians & midwives modus vivendi for current times. *MJA*, 182(9), 436–437.
- Whitehead, D. 2005. Health promoting hospitals: the role and function of nursing. *Journal of Clinical Nursing*, 14(1), 20–27.
-



- 
- World Health Organisation. (1996). *Care in normal birth: a practical guide. Report of a technical working group*. Maternal and newborn health/safe motherhood division of reproductive health, World Health Organisation, Geneva. Retrieved April 9, 2006, from World Health Organisation website: [www.who.int](http://www.who.int).
- World Health Organisation. (1998). World health day, safe motherhood, every pregnancy faces risk. Retrieved April 9, 2006, from Web site: [www.who.int](http://www.who.int).
- Wickham, S. (2003). *Midwifery best practice*, Sydney: Elsevier Science Limited.
- Williams, L. (2006). What goes around comes around: evidence-based management. *Nursing Administration Quarterly*, 30(3), 243–251. Retrieved October 29, 2006 from Web site: <http://gateway.ut.ovid.com.ezproxy1.acu.edu.au/gw1/ovidweb.cgi>
- Wood, S. (2003). Should women be given a choice about foetal assessment in labour? *The American Journal of Maternal/Child Nursing*, 28(5), 292–298.