THE EFFECT OF UNRESTRICTED FLUID INTAKE DURING LABOUR ON THE MULTIPAROUS WOMAN AND HER PERCEPTION OF CONTROL AND PAIN DURING CHILDBIRTH

BY

FLORENCE ELAINE KLASSEN

A Thesis
Submitted to the Faculty of Graduate Studies
in Partial Fulfillment of the Requirements
for the Degree of

MASTER OF NURSING

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ABSTRACT

In many birthing units it is common practice to restrict oral fluid intake during labour and delivery. Research has demonstrated that the practice of eating and drinking during labour does not impose a threat and, in fact, may benefit women in labour (Roberts & Ludka, 1993; Rooks, et al, 1989; Greulich, et al, 1994). The philosophy that childbirth is a healthy, normal event formed the basis for a randomized clinical trial of unrestricted drinking during labour as it relates to the multiparous woman's perceptions of control and pain. Information about related interventions, length of labour, use of additional treatments and newborn outcomes was also gathered. Differences between the experimental group that received unrestricted fluids and the control group that received restricted fluids were not statistically significant. Since women who had full fluids had outcomes that were no worse than those who received only clear fluids nurses in clinical practice should advocate for more liberal fluid intake for women in labour. Additional research is needed with larger sample sizes to examine this issue of oral intake during labour.

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CHAPTER ONE: INTRODUCTION

Background to the Problem

Oral intake during labour has been restricted since Mendelson (1946) published a retrospective analysis of aspiration (an incidence of 0.09%) during general anaesthesia for childbirth. Mendelson reported the use of an opaque mask for the administration of anaesthesia, the attendance of novice anaesthetists and evidence of delayed gastric emptying during labour. Since this landmark study was published, treatment of obstetrical patients has changed. Present-day obstetric practice has evolved from the routine use of general anaesthesia to the frequent use of regional nerve blocks when and if anaesthesia is required. Modern-day practice for a general anaesthetic has also changed and use of a rapid sequence induction technique with preoxygenation followed by endotracheal intubation is standard practice. Furthermore, general anaesthesia in obstetrics is no longer considered the field of the novice as was true in Mendelson's time; instead, anaesthesia is considered a specialty practice and anaesthesiologists assigned to administer obstetric anaesthesia often have additional training above the specialty requirements. Finally, and as a direct result of this early study it is always assumed that the woman in labour has a full stomach, and she is managed accordingly during the induction of a general anaesthetic.

In related animal studies, Mendelson (1946) demonstrated that several hours of laboured breathing and cyanosis occurred after neutral fluid aspiration (distilled water, normal saline or neutralized liquid vomitus). No deaths due to liquid aspiration occurred in any group. Mendelson suggested, but did not demonstrate, that labour delays gastric emptying. Crawford (1986) noted that the incidence of maternal mortality related to acid

aspiration has actually increased since the advent of oral intake restriction during labour. Roberts and Shirley (1976) found that fasting for more than 20 hours "should be taken as a warning rather than as reassurance" (p.614).

Women continue to encounter restrictions on oral intake in labour despite the evolution of obstetric anaesthetic practices since Mendelson's study. The use of intravenous fluids to maintain or restore hydration in labour has become commonplace, often without consideration for alternative measures or the potential negative effects to the mother or her fetus/neonate (Carmen, 1986; Gabbe, 1988; Keppler, 1988; Newton, Newton & Broach, 1988; Pollack, 1988). In the past, the practice of administering routine intravenous fluids during labour was associated, in both the mother and the fetus/neonate, with hyperglycemia, hyperinsulinemia and rebound hypoglycemia; increased lactic acid levels, lower pH and hyponatremia (Carmen, 1986; Gabbe, 1988; Keppler, 1988; Philipson, Kalhan, Riha & Pimentel, 1987). Newton, Newton and Broach (1988) postulated that large rapid injections of glucose might decrease the pain threshold of labouring women.

The constraint of normal behaviour imposed by intravenous infusions compromises the woman's sense of control and increases her discomfort and the stress she experiences (O'Sullivan, 1994). The physical impediment of the intravenous apparatus limits her ability to be mobile during labour, although it is well known that activity reduces the intensity of labour pain and enhances the progress of labour (Melzack, Belanger & Lacroix, 1991).

Broach and Newton (1988a) suggested that this practice illustrates "cultural lag", that is, behaviour that continues after its purpose has become obsolete. Others

(Lederman, 1988; Oakley, 1985; Davis-Floyd, 1990, 1992, 1994) state that in the medical culture of childbirth the restriction of oral intake is a custom.

A common philosophy within this culture is that the medical professional controls the birth process. Beynon (1988) suggests that if women are allowed to control their own behaviours during labour they can minimize their perceptions of pain. Simkin (1986a) postulates that when the physiologic and psychologic stresses reach maladaptive proportions the sensations of pain and catecholamine levels are increased, fetal well-being is compromised and the length of labour increases. Simkin (1986b) reported that 57 percent of women in her survey (N=159) found the restriction of oral intake during labour moderately to severely stressful. Lowe (1996) posits that control over the stress of pain during labour is a milestone in the woman's development of self-esteem and personal strength. Flint (1986) states it is the duty of the midwife to encourage intake during labour, thereby increasing the woman's pain threshold.

Despite evidence that eating and drinking during labour may enhance the birth process, most hospital oral intake policies continue to be restrictive. No randomized clinical trials of unrestricted oral intake are reported in the Cochrane Perinatal Database (1995). Furthermore, no studies address oral intake during labour (M. Enkin, personal communication, July 29, 1996; R. Soll, personal communication, August 5, 1996). Enkin, Keirse, Renfrew and Neilson (1995) discuss nutrition during labour and birth, noting that, "Measures to reduce the volume and acidity of gastric contents cannot compensate for inadequate anaesthetic technique". The Technical Working Group of the World Health Organization (WHO) (1997) has recommended that oral fluids be offered

to women during labour and birth, and has listed the restriction of food and fluids during labour as a practice that is "frequently used inappropriately" (p. 123).

"We believe if you start proposing such changes (in nothing by mouth policy), no anesthesiologist will work at your institution". Thus reads one response to the survey conducted by McKay and Mahan (1988b, p. 222). However, members of the medical profession are becoming aware that reluctance to deal with the issue of oral intake during labour has hindered optimal care for women. A randomized clinical trial of oral fluid intake is the first step to scientifically addressing the issue, promoting a clear understanding of the effects of oral intake during labour, supporting evidence-based practice, and helping women have better experiences and outcomes. The next study should investigate unrestricted eating and drinking to further develop research-based practice in the care of women during childbirth.

Childbirth is a normal physiological event in a woman's life. Unless there is evidence of underlying disease or superimposed pathology it may be understood as a healthy process. However, many institutions have policies that restrict oral intake during labour. This practice has a potential impact on the pain and control women perceive during labour. A randomized clinical trial of oral fluid intake during labour and its effect on the perceived control and pain of multiparous women will promote the development of practice that is based on scientific data rather than fear or ritual.

Statement of the problem

Women, if left to make their own choices, drink throughout childbirth (L. Ludka, personal communication, August 10, 1996; Roberts & Ludka, 1993; Rooks, et al, 1989; Greulich, et al, 1994). However, anaesthesiologists discourage and control this practice,

citing the dangers of aspiration (Gibbs, Krischer, Peckham, Sharp & Kirschbaum, 1986). It is the purpose of this study to discover whether this restriction is relevant to women's sense of control and perceptions of pain during childbirth.

The primary hypotheses of the study are:

1. Unrestricted fluid intake during childbirth gives the multiparous woman a greater sense of control;

2. Unrestricted fluid intake during childbirth results in lower perceptions of pain in the multiparous woman.

The secondary hypotheses are:

3. Length of labour will be shorter in the experimental group (unrestricted fluids);

4. The incidence of interventions will not differ between experimental and control groups;

5. Neonatal outcome will be the same in both groups.

CHAPTER TWO: LITERATURE REVIEW

The body of literature that addresses oral intake during labour is varied. No randomized clinical trials of oral intake during labour have been found. Thus, this review of the literature has been divided into related topics published by various authors. This chapter will describe the literature reviews, clinical studies, surveys, qualitative studies and retrospective analyses related to oral intake during labour. The concepts of control and pain also will be presented.

Literature Reviews

McErleen (1993) reviews the historic importance and function of the food and fluids taken during labour. It is noted that if intravenous therapy is initiated to treat dehydration, other interventions are more likely to follow. The author concludes that positive practices such as providing nutrition would prevent dehydration and ketosis, minimize analgesic requirements and improve the labouring woman's morale.

O'Sullivan (1994) reviews literature describing gastric emptying during labour. The author notes that narcotics inhibit gastric emptying, as does the pH, temperature, osmolality and fat content of the food itself. Benefits of oral intake during labour include maternal satisfaction, maintenance of serum glucose, preservation of muscle glycogen and a possible reduction in maternal fatigue. Fluids that are light, low in fat, and high in carbohydrate are advocated as appropriate fare.

Bogod (1995) examined the effect of pregnancy and analgesia during labour on gastric emptying and the "controversial subject of feeding in labour in the light of current information and modern practice" (p. 224). The author noted that gastric acidity is reduced during pregnancy and that pregnancy does not affect the rate of gastric emptying,

although it may be reduced during labour. No pH has been documented as `safe' (despite the standard use of pH > 2.5) and many people who fast for varying lengths of time have a volume of gastric contents that is generally considered unsafe (i.e. > 25mL). The author cited evidence that opioid analgesics, both systemic and epidural, delay gastric emptying of solid food during labour.

The practice of withholding food and fluids was objectively examined, citing Mendelson's (1946) recommendations as the basis for current practice. The reluctance of women to eat and drink must be balanced by the distress engendered in women who are not free to choose. Furthermore, the increasing use of regional analgesia for urgent instrumental intervention makes the argument that all women should fast tenuous at best.

Bogod (1995) suggested that women who may be at risk for intervention should be identified and have their intake restricted. The women who were allowed foods and fluids in Nottingham City Hospital, the author's practice venue, are listed in Table 1. A decision tree to triage women for the various protocols accompanied the article. Table 2 lists fluids that were available to women in established labour. The author noted that consumers should be involved in setting oral intake protocols, stating that scientific data do not support the indiscriminate fasting of women during labour.

Sharp (1997) reviewed literature related to acid aspiration, vomiting, regurgitation, pregnancy, gastric emptying, policies for oral intake and treating labouring women as presurgical patients, and maternal/fetal sequelae of food and fluid deprivation. Findings corroborated the work of McErleen (1993), O'Sullivan (1994) and Bogod (1995). The author reiterated that the topic of oral intake during labour is controversial, and that opinion and practice are inconsistent. She concluded "restriction of oral intake in

labour is another example of how a sensible plan of management of high-risk women becomes common practice for all" (p. 412).

Table 1

Women who can eat and drink in labour *

- Not high risk (i.e. no risk factors as listed below):

- opiate usage	- trial of labour
- uterine scar	- medical illness
- multiple pregnancy	- Rhesus disease
- breech	- IUGR
- pregnancy induced hypertension	- fetal distress
- antepartum haemorrhage	- meconium
- known anaesthetic problem	- slow progress

- Is in labour
- Labour is being induced with Prostaglandin gel

(* Bogod, 1995)

Table 2

Drinks for low-risk labour *

(low fat and < 10g sugar per 100 mL (max. 100 mL/hr)

- Water
- Tea
- Coffee
- Skim milk (may add milk shake powder)
- Reduced calorie drinks'
- Squash with water
- Reduced calorie soup
- Orange juice
- Tomato juice
- Yogurt drinks
- Small amounts of ice in drinks

(* Bogod, 1995)

Clinical studies

Roberts and Shirley (1975) undertook a study to determine which patients in labour were at highest risk for aspiration pneumonitis, and to assess the value of antacid administration in maintaining a gastric pH over 2.5. Gastric aspirations of women undergoing general anesthetics for Caesarean section were carried out to determine gastric volume related to time from last meal to delivery. Results indicated that no time

interval ensured a gastric volume of less than 25 milliliters, the volume postulated as enough to produce lung pathology in adult women. Furthermore, gastric volume increased as the hours of fasting increased. Finally, the authors noted that if antacids were given more than four hours prior to delivery an acid rebound might actually increase the risk of pneumonitis if aspiration did occur. Despite these findings, they recommended that obstetricians practice NPO and antacid therapy during labour. This recommendation exemplifies Brody and Thompson's (1981) thesis that obstetric practices illustrate a "maximin strategy", that is, making the best of the worst possible outcome, regardless of the probability that the outcome will occur.

Roberts and Ludka (1993) carried out a descriptive study to observe women's practices of eating and drinking in labour. All 76 women in this study chose to drink during labour. Fifty percent of women ate and drank during the early and active phases of labour, and 41 percent drank during the second stage. Fluid intake decreased as labour progressed. No cases of maternal aspiration or death occurred. Authors concluded that, despite small sample sizes and no control group, oral intake during labour is safe and should be encouraged with anticipatory guidance to the woman and her partner.

Lederman, Lederman, Work and McCann (1985) studied the relationship of self-reported maternal anxiety, observed stress, and plasma epinephrine and norepinephrine levels to the progress of labour and fetal heart patterns in 73 multiparous women. Increased anxiety in active labour was related to increased serum epinephrine and norepinephrine levels ($r = 0.29$ and 0.42, respectively) and the length of early labour ($r = 0.34$). Fetal heart rate patterns were adversely affected and epinephrine levels were elevated ($r = 0.34$) when mothers reported high stress ($r = 0.26$) and concerns about

coping (r = 0.25) and safety (r = 0.38). During the transition phase of labour fetal heart rate changes were related to both plasma epinephrine levels and maternal stress (r = 0.30). Findings of this study indicate that biochemical processes that affect perceptions of pain influence both mother and fetus during labour.

Carp, Jayaram and Stoll (1992) used ultrasound to study gastric emptying in non-pregnant, pregnant and labouring women. The authors found that no food was visible in the stomach four hours after meals both in non-pregnant and pregnant women. Of the 73 near-term women in this study, 39 were in active labour. Gastric contents were determined within one hour of epidural analgesia administration. No women had received narcotics. Food was detected in the stomachs of 16 women although they had not eaten for eight to 24 hours; nearly two thirds had food in their stomachs throughout labour. No adverse effects were reported.

O'Reilly, Hoyer and Walsh (1993) observed a convenience sample of 106 low-risk women during five stages of labour (early, active, transition, second stage and third and fourth stage) to examine oral intake and the incidence of emesis during labour. A gradual decrease in oral intake was noted as labour progressed. More than 80 percent of the women (N = 106) had no emesis. If women vomited once, they were more likely to do so again. No incidents of aspiration were documented. The authors noted that type or amount of intake did not correlate with the incidence of emesis. They concluded that women should be able to regulate their own intake as long as they are not at risk for surgery under general anaesthetic. The controversy about emesis and its relationship to aspiration of stomach contents appears to be based on opinion and fear rather than on

scientific data. As such, then, emesis during labour should not dictate dietary management.

There is conflicting evidence about the effects of epidural opioid administration on gastric emptying. Wright, Allen, Moore and Donnelly (1992) compared gastric emptying in two groups of women (N = 30) who received epidural analgesia during labour. Using serum paracetemol levels the authors demonstrated that epidural analgesia that included a single dose of fentanyl 100 μg in addition to bupivacaine resulted in a delay of gastric emptying, although "the delay was not marked" (p. 250).

Zimmerman, Breen and Fick (1996) used serum acetaminophen levels to compare gastric emptying in 28 women who received continuous epidural analgesia of either bupivacaine or bupivacaine with fentanyl. The initial dose of fentanyl 50 μg was followed by an infusion of fentanyl 20 μg per hour in the experimental group. Participants were not allowed to eat or drink during the study. Comparison of the two groups demonstrated that the use of fentanyl did not delay gastric emptying. The authors concluded, "concern about delayed gastric emptying with the addition of small-dose fentanyl to local anesthetic continuous epidural infusions is not warranted" (p. 615).

Staff at Nottingham City Hospital monitored the implementation of an evidence-based "oral intake in labour" policy (Newton & Champion, 1997). The pilot implementation of the policy included only primiparous women, "because they were considered to be the least predictable in terms of delivery outcome and would test the risk factors most stringently" (p. 419). As a result of the pilot project the policy was expanded to include all women in labour. Monitoring is continuing, with the following standards:

- No more than one percent of the women who eat during labour will experience a general anaesthetic;
- At least 80 percent of women are offered food and drink during labour;
- At least 80 percent of women should be informed of the policy before labour begins;
- At least 50 percent of women should have the policy explained to them.

Surveys

Rooks and colleagues (1989) undertook a multi-center survey of 11,814 births in 84 birth centers to investigate their safety. Women who gave birth in these centers, when compared with all women who gave birth in the United States, were more likely to be over 18 years of age, white, married, college educated and be in a parity grouping associated with low risk (i.e. not a first, or sixth or subsequent baby). They were less likely to use alcohol or smoke. Data demonstrated that although 95 percent of women ate or drank in labour no incidents of aspiration occurred, even in women who had emergency Caesarean sections. The rate of Caesarean section was 4.4 percent. Seven percent of multiparous women were transferred to hospital for management of complications. The neonatal mortality rate, including intrapartum and neonatal deaths, was 1.3 per 1000 births. The authors concluded that birth centers are a safe alternative to hospital care, especially for multiparous women, and are associated with a high degree of satisfaction. The safety of more liberal eating and drinking practices for low-risk women is strongly supported by these data.

Reviews of oral intake policies for labour demonstrate significant differences in practice (Berry, 1997; Micheal, Reilly and Caunt, 1991; McKay and Mahan, 1988b). The

majority of maternity units surveyed in England and Wales and in the United States allowed oral fluid intake (96.4% in the former and 53% in the latter). However, this evidence suggested that many women were prevented from drinking during labour. Comparisons of international maternal morbidity reports demonstrate that aspiration is uncommon, especially when regional anaesthesia is used. If it were true that restrictive policies protect women from morbidity related to aspiration, then statistics from institutions with restrictive oral intake policies in labour should demonstrate a lower incidence of maternal and neonatal mortality and morbidity (Crawford, 1988). However, this is not the case. Furthermore, there is no evidence that liberal oral intake contributes to maternal and neonatal compromise.

Crawford (1988), in his commentary to McKay and Mahan, noted that good anaesthetic technique and poor patient preparation are an inappropriate match. He stated that light food and drink should not be denied women in active labour, but that routine antacid prophylaxis should occur. McKay and Mahan (1988c) concluded that 'starvation in labour' is not justified as a dietary regimen that ensures the best possible outcomes for mother and baby.

Gibbs, Krischer, Peckham Sharp and Kirschbaum (1986) surveyed administrators and chiefs of obstetrics and anaesthesia to determine the reason for anaesthetists' dislike for obstetric anaesthesia. The majority of responses came from hospitals doing more than 1,500 deliveries per year. Both obstetricians and anaesthetists stated that the other specialty had insufficient knowledge or background in obstetric or anaesthetic practice. For example, anaesthetists intimated that a better understanding, by obstetricians, of the "risks associated with general anesthesia would surely discourage any physician from

encouraging eating and drinking during labour – a practice particularly irksome to anesthesiologists" (p. 305). Forty-six percent of obstetricians in the study believed anaesthesiologists "lack sufficient training in obstetric anesthesia" (p. 303).

Qualitative studies

Several studies (Mackey, 1995; Dimatteo, Kahn and Berry, 1993; Bluff and Holloway, 1994; Butani and Hodnett, 1980; Drew, Salmon and Webb, 1989; Wuitchik, Hesson and Bakal, 1990) have sought to ascertain women's opinions of their childbirth experiences. Personal control and loss of autonomy were major themes in the data. Many women recognized that although they would sacrifice control for the baby's well-being, they also wanted to maintain control over potential interventions during their labours. They expressed distress at having to relinquish control to health care practitioners at a time when they felt vulnerable and powerless to challenge that control. Drew and colleagues found that both mothers and obstetricians have the same primary objective: a healthy baby. However, women also stated that information about and control over procedures were high priorities. Wuitchik and colleagues, from their study of predictors of pain and distress during labour, concluded that fear of helplessness (lack of control) is one predictor of increased perceptions of pain in the latent phase of labour. Butani and Hodnett found that pain and loss of control were most commonly cited as the worst facets of labour.

Retrospective analyses

The Jewish Yom Kippur fast provides a natural setting to observe the effect of fasting for pregnant women. In Jerusalem, Kaplan, Eidelman and Aboulafia (1983) observed a statistically significant increase ($P < 0.01$) in the number of term deliveries

during the 24 hours immediately following a 24-hour food and water fast for two consecutive years. The authors conclude that, although "the clinical implications are not yet clear...there might well be a special risk for those mothers with a tendency toward early delivery, should they undertake a rigorous fast" (p. 1318).

Ludka (1987) noted that intervention rates increased dramatically during a six-month period when eating and drinking during labour was not allowed at North Central Bronx Hospital. Instrumental deliveries increased by 35%, Caesarean sections increased by 38%, and the need for newborn intensive care increased 69%. Aspiration occurred only in one woman who had had no oral intake for 36 hours. When eating and drinking were again allowed, these intervention rates decreased to their previous levels.

Haire and Elsberry (1991) chronicled the maternal and neonatal outcomes at North Central Bronx Hospital during 1986. This hospital serves a population of "the poorest and most disadvantaged" (p. 33) families in the Bronx. The philosophy and policies of the obstetric unit reflect a non-interventionist approach to care. In addition, no woman is turned away if she arrives during labour, although eleven percent of women have had no prenatal care. It was deliberately decided that women who were unlikely to require Caesarean section were allowed to eat lightly and drink fluids to maintain their stamina and ability to cope during labour. After twelve years and nearly 30,000 births no incidents of maternal aspiration were recorded. Thirteen percent of mothers received analgesia during labour. It is unclear from the report whether this included the 7% of women who received epidural analgesia. The Caesarean section rate in 1988 was 11.8% and the instrumental delivery rate was 0.3%. Oxytocin induction occurred in 6.4 % of cases, and manual removal of placenta in 1.3%. Of the 7.1% of women who received

episiotomies, 2.3% of women suffered third or fourth degree lacerations. Meconium staining occurred in 15% of women, but the quality of the meconium is not reported. The authors reported Apgar scores of greater than or equal to seven at one minute in 89.8% of neonates despite a low-birth weight rate of 10.2%. These outcomes support the philosophy that proactive labour care such as encouraging activity or oral intake can have a positive effect on birth outcomes for women with multiple risk factors.

Retrospective analyses of outcomes of birth center and hospital births confirm evidence that oral intake in labour is not harmful, and that the increased control experienced by women during their labours may actually benefit them and their infants. Birth centers are facilities designed to provide care to low-risk women during labour and childbirth (Rooks, et al., 1989). Care is based on the philosophy that childbirth is a normal life event in which women exert autonomy. The safety of women and neonates in such settings has been questioned. Hence, rigorous retrospective analyses of birth center and matched hospital clientele have been undertaken (Feldman & Hurst, 1987; Greulich, et al., 1994). Analyses included incidence of maternal and neonatal mortality and morbidity, use of interventions during labour (Table 3) and the incidence of selected complications (Table 4). Neither maternal nor neonatal mortality occurred in Greulich and colleagues' (1994) or Feldman and Hurst's studies. The studies indicated that birth center clients were encouraged to maintain intake of food and fluids during labour. Feldman and Hurst recorded data from 149 charts (77 birth center and 72 hospital) during three months in 1981, whereas the review by Greulich and colleagues spanned 12 years (1971-1982) and included the records of more than 30,000 births.

Table 3

Interventions during labour *

Oxytocin augmentation
Amniotomy (AROM)
Electronic fetal monitoring (EFM)
Intravenous infusions
Oxygen administration
Episiotomy
Systemic/regional analgesia
Forceps/vacuum extraction
Manual removal of placenta
Caesarean Section

(* Feldman & Hurst, 1987; Greulich, et al., 1994)

Despite Feldman and Hurst's (1987) relatively small sample size the findings were congruent with the larger retrospective analysis. Operative deliveries were rare: Caesarean section rates were 6.5 and 1.8 percent and vacuum/forceps deliveries occurred 5.6 and 2.3 percent of the time in the birth centers. These results may be compared to concurrent hospital data that demonstrated a Caesarean birth rate of 11.3 percent, and a 43.7 percent forceps delivery rate in matched subjects.

Table 4

Selected complications during labour and birth *

- Length of labour
- Fetal heart rate abnormalities
- Thick meconium
- 5-minute Apgar <7 or 8
- Failure to progress
- Severe shoulder dystocia
- Postpartum haemorrhage
- Retained placenta
- Maternal temperature >37.8 Celsius
- Third and fourth degree lacerations

(* Feldman & Hurst, 1987; Greulich, et al., 1994; Rooks, et al., 1989)

Neonatal complications requiring transfer to an intensive care unit were greater in the hospital group (5.6%) than in the birth center (1.3%) group. The incidence of neonatal Apgar scores of less than 8 at 5 minutes were 0 and 0.4% in the birthing centers (Feldman & Hurst, 1987; Greulich, et al., 1994, respectively). Feldman recorded a 5-minute Apgar score of less than 8 in 1.5% of hospital births. However, group size of compromised infants in both studies was too small to make predictions about morbidity and mortality.

Feldman and Hurst (1987) noted that the lengths of both first and second stage labour were longer in the birth center group than in the comparable hospital clientele. The first stage of labour (active labour to full dilatation of the cervix) was longer than 12 hours in 1.6% of women in the hospital and 26.1% in the birth center ($P < 0.0001$). A second stage (full cervical dilatation to delivery) of more than 2 hours was recorded in 4.8% of hospital births and 18.8% of birth center deliveries ($P < 0.02$). Authors postulated that this might be due to the increased incidence of interventions such as oxytocin augmentations and amniotomy in the hospital group. The use of forceps and episiotomy also were significantly more frequent in the hospital group ($P < 0.0001$). Greulich and colleagues did not comment on the length of labour or the incidence of augmentation of labour in the hospital group except to state that alternative therapies such as breast stimulation, ambulation and showers were frequently used to stimulate labour in the birth center.

The possibility of anaesthetic-related maternal death continues to influence the limiting of oral intake by anaesthesiologists. However, Hawkins, Koonin, Palmer and Gibbs (1997), in a review of anesthesia related deaths in the United States between 1979 and 1990, found that the three major risk factors are obesity (present in 80% of cases), emergency surgery (80% of cases) and hypertension (present in 53% of cases). These data exclude the majority of women who are experiencing normal pregnancy and birth.

Conceptual Framework

The conceptual framework for this study is based on the philosophy that labour, for most women, is a state of health (Davis-Floyd, 1992). As such, then, it should be viewed by caregivers as a normal process with little inherent risk. Positive professional

practice that enhances labour includes the prevention of dehydration, encouragement of ambulation, decreasing analgesic requirements and client support (Rooks, et al., 1989; McErleen, 1993; Greulich, et al., 1994).

Childbirth is both a physiological and a psychological experience (Walker, 1992). In women's descriptions of their childbirth experience, control or lack of it is a common theme. Women evaluate their success during labour and delivery not only by their expectations and how they maintained their self-esteem, but also by how well they "maintained control".

Butani and Hodnett (1980) conceptualize the facets of control as both internal and external. The internal forces comprise the physiological processes of labour and the coping mechanisms used to manage these forces. The external forces include environmental influences such as anaesthesia and hospital routines, and the degree to which the woman is allowed to participate in decision-making about the management of her labour. Control may be real or perceived. Expectations and experiences of control have been identified as having a positive impact on childbirth satisfaction and self-esteem (Humenick & Bugen, 1981).

Butani and Hodnett (1980) interviewed 50 women about their perceptions of labour. Sixteen of the 50 women in the study who expressed regret about their behaviour during labour cited loss of control as the major source of regret. In addition, 39 women expressed that personal control was important to them during labour. In summary, the control that is so significant to women may be control over the self (e.g. breathing exercises, not screaming), control over others (e.g. having one's wishes respected by hospital staff) or control over the environment in which birth occurs.

Pain is one of the stressors that a woman must deal with during childbirth. It is a complex phenomenon that has both physiologic and psychologic properties. Beynon (1988) suggests that women can minimize the pain of labour if they are left to control their own behaviours. Lowe (1996) postulates that mastery, or control, over this stressor is one milestone to the development of an increased self-esteem and personal strength in women. It has been noted that home births have been perceived as significantly less painful than hospital births (Morse & Park, 1988).

McErleen (1993) utilized a framework that focussed on the real and potential risks of withholding food and fluids during labour, and treatment that has been considered prophylactic in the prevention of these risks. This framework has been redesigned to demonstrate the potential outcomes of oral intake during labour (Figure 1).

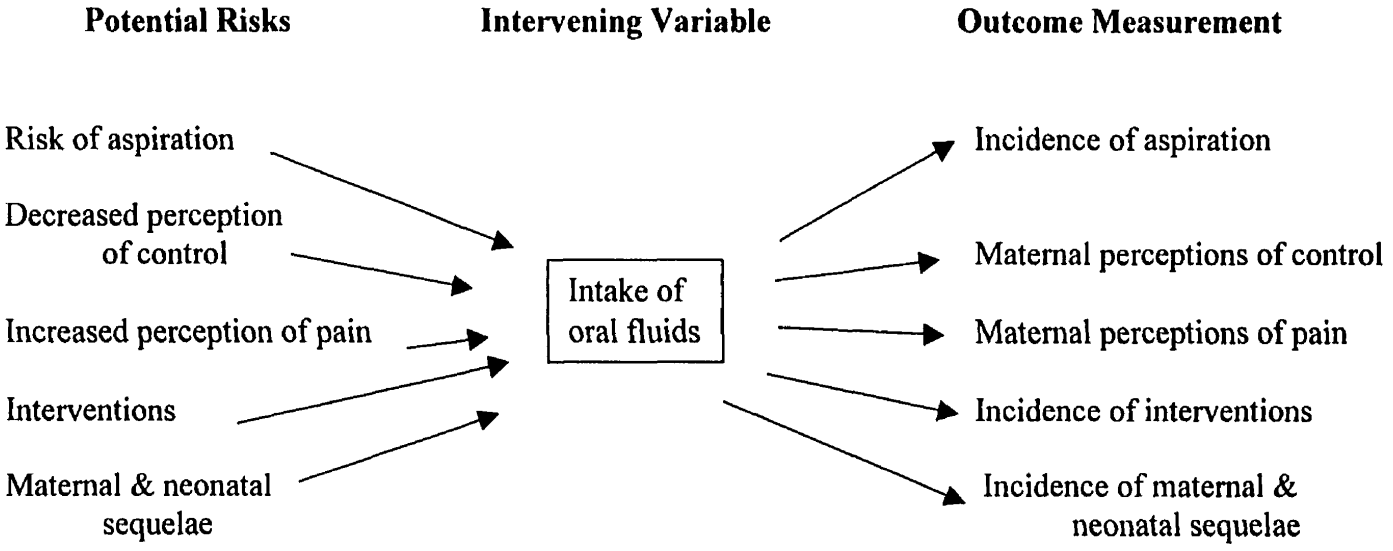
The potential risks of withholding oral food and fluids include the risks of aspiration, increased length of labour and the use of interventions (and their potentially negative sequelae). The risks of aspiration include pneumonia secondary to the aspiration of acidic stomach contents. According to Kilpatrick and Laros (as cited in Cunningham, MacDonald, Gant, Leveno & Gilstrap III, 1993) and Cassidy (1993) labour, for the multiparous woman, is typical if it between six and seven hours long with a mean length of 5.7 hours for the first stage and 9 minutes for the second stage.

Interventions that may occur with greater frequency, if oral intake is restricted during labour, include intravenous infusions for hydration, oxytocin augmentations of labour and systemic or regional anaesthesia. Operative delivery (including Caesarean section, vacuum extraction and forceps) due to failure to progress or maternal fatigue in labour may also be more common (Ludka, 1987). Maternal sequelae include loss of

control or autonomy during labour and birth, stress and the direct effects of interventions. These direct effects might include aspiration of gastric contents, fluid overload, phlebitis at intravenous injection sites or infections. Fetal/neonatal sequelae include the presence of thick meconium, fetal distress, neonatal hyperbilirubinemia, hypoglycemia and low Apgar scores.

A review of the literature implies that oral intake during labour may influence both the physiologic and psychologic components of labour. Overall, opinions about oral intake in labour are diverse, ranging from fierce opposition to scientific support for the practice. This study is the first step in scientifically and ethically examining the potential positive effects of oral intake during labour, particularly on women's perception of control and pain.

Figure 1 Conceptual Framework



CHAPTER THREE – RESEARCH METHOD

A randomized clinical trial (RCT) design was chosen to examine the research questions. The RCT provides a method whereby an intervention may be objectively and systematically evaluated for safety and efficacy (Pocock, 1983; The standards of reporting trials group, 1994).

Population, Sample and Inclusion Criteria

The sample was to consist of 100 multiparous women admitted, in labour, to a tertiary care centre in Winnipeg. The inclusion criteria are listed in Table 5. Exclusion criteria are listed in Table 6. Indications for transfer out of the study are listed in Table 7. The contents of the tables were adapted from the work of Greulich and colleagues (1994).

Table 5

Inclusion criteria for oral intake in labour study *

- Multipara (Gravida 2 Para 2 to Gravida 6 Para 5)
- Gestational age > 36 to < 42 completed weeks
- Gestational age ≥ 43 weeks with reactive non-stress test and amniotic fluid index ≥ 10 cm
- Estimated fetal weight 2500 to 4000 g

(* adapted from Greulich, et al, 1994)

Table 6

Exclusion criteria for oral intake in labour study *

- Anaemia (Hgb < 100 g/dL)
- Parity > 5
- Previous Caesarean section regardless of type of uterine scar
- Previous difficult delivery
- Weight > 102 Kg
- Hypertension > 140/90 mm Hg
- Proteinuria > 2+
- Positive syphilis serology, untreated
- Client in custody
- Spontaneous rupture of membranes - not in labour
- Signs or symptoms of amnionitis
- At-risk class A-1 diabetics, including history of
  - Previous overt diabetes
  - Prior antepartum stillbirth
  - Traumatic delivery due to macrosomia
- Abnormal vaginal bleeding
- Multiple gestation
- Temperature > 38 degrees Celsius
- Unidentifiable presenting part
- Station > -3
- Acute or chronic medical condition
- Non-vertex presentation
- History of postpartum haemorrhage
- History of retained placenta
- History of uterine scar
- Physician request

(* adapted from Greulich, et al, 1994)

Table 7

Indications for transfer out of the study *

Fetal:

- Abnormal fetal heart rate pattern indicative of fetal distress that is unresponsive to alleviating interventions

Maternal:

- Evidence of amnionitis
- Development of pregnancy-induced hypertension
- Request for narcotic analgesia
- Hematocrit < 28 % on admission
- Hemorrhage prior to delivery
- Prolonged second stage (more than 2-3 hours)
- Failure to progress in active labour
- Client request to cease participation
- Physician request

(*adapted from Greulich, et al, 1994)

Recruitment procedure

The Ethical Review Committee of the Faculty of Nursing granted ethical approval for the study at the University of Manitoba. Access was obtained from St. Boniface General Hospital via the Hospital's Nursing Research Office. The permission of the

Department of Anaesthesia was sought via Dr. Diane Biehl (External member, Thesis Committee) and Dr. Raoulf Wahba, Head of Obstetrical Anaesthesia. A presentation of the study was made at Perinatal Rounds. The presentation date was arranged two weeks in advance to allow for notification of obstetricians/family physicians and Hospital staff. The interval during which data collection was to occur was included in the presentation. In addition, a short synopsis of the study, including the researcher's telephone number, was available. Those physicians who did not want their patients in the study were asked to call the researcher so that these women might be excluded from consideration. The Head of Family Practice was called to ensure his awareness of the study and to inform his Unit of the study/presentation and the opportunity to block patients from the study. No physicians contacted the researcher. Nurses practising in the maternal/child department were also invited to Perinatal Rounds. The need for and focus of the study were presented. The study protocol was reviewed and questions entertained

A clinical resource nurse or direct care nurse in the Labour and Delivery Unit identified women who met the inclusion criteria. The researcher provided copies of the Invitation to Participate (Appendix A) to be given to eligible women by the direct care nurse. If the woman gave verbal consent to participate the researcher introduced herself, obtained consent (Appendix B) and proceeded with data collection. All women were offered a summary of the study.

Data Collection Protocol

The nurses in the Labour and Delivery Unit were informed regarding the nature of the study and their role in ensuring robust results. Education of this nature is imperative

to the quality of the study and to secure adherence to study procedure. Breaking study protocol subverts the randomization process and weakens study results (Schulz, 1995). Two colours of stickers were affixed to the chart and patient information board to identify women in the experimental and control groups. This facilitated identification of study subjects for both nurses and physicians. During data collection the nurses were asked to make the researcher aware of every vaginal examination so that the Short-form McGill Pain Questionnaire (SF-MPQ) could be administered and the Fluid Intake Log (Appendix F) reviewed. The staff were given a list of fluids that the experimental group could request (Appendix C), and were asked to encourage these women to drink. They were asked to follow their normal practice for women in the control group. At the time of the study, women were allowed clear fluids such as apple juice, orange juice or lemonade in early labour. Once active labour began (i.e. 3-5 cm. cervical dilation) women in the control group were limited to ice chips only.

The researcher visited the Labour and Delivery unit at least three times per week until data collection was complete. A minimum of ten hours per week was allocated to the project, and the researcher was accessible by telephone between visits. The researcher served as a resource for health care professionals during data collection, but did not suggest whether or not study participants should drink. After delivery, the Fluid Intake Log was collected and filed with the Data Collection Form (Appendix H). It was expected that data collection and analysis would be complete within 52 weeks.

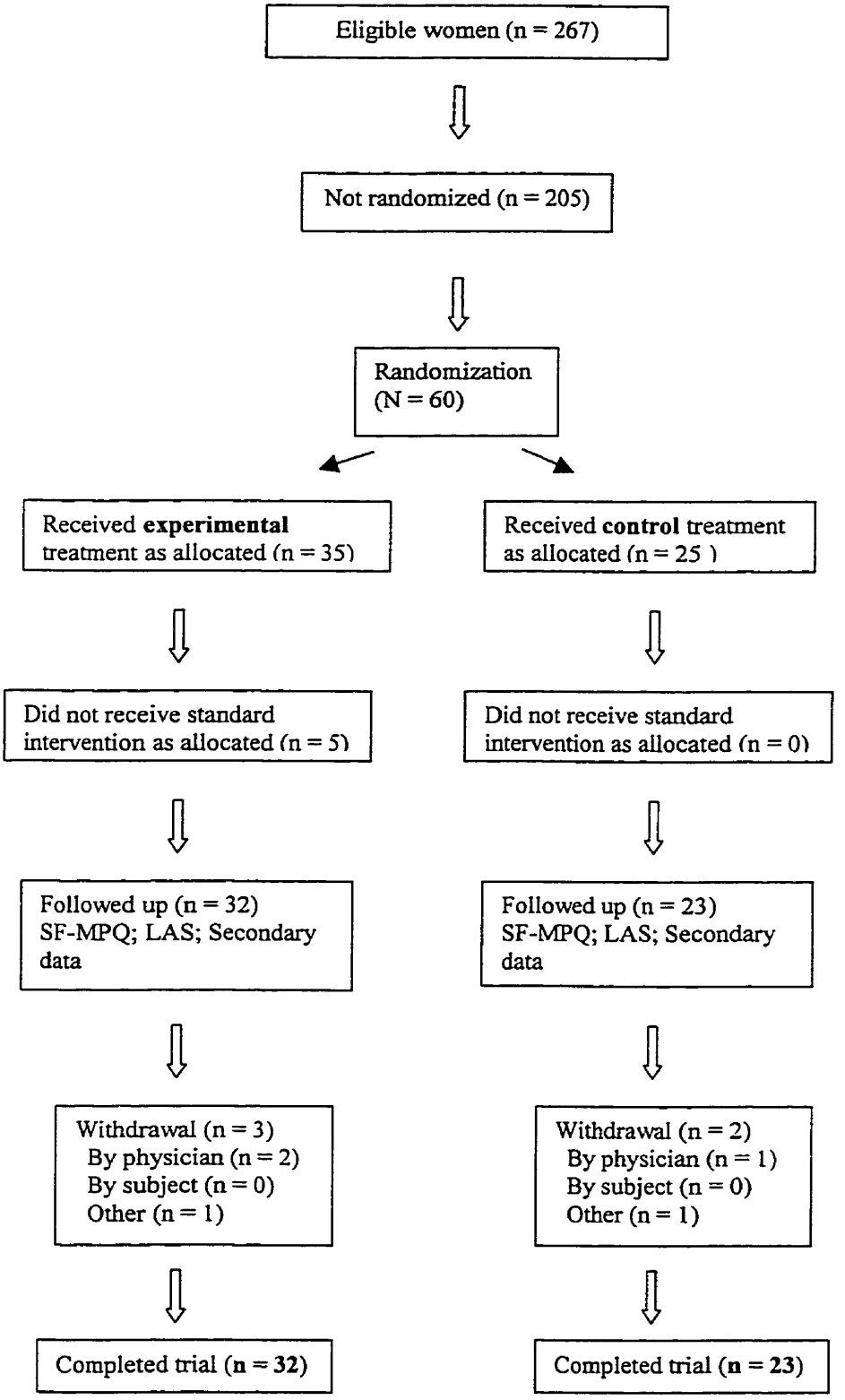
Figure 2, adapted from Begg and colleagues (1996), illustrates the progress of women through the study. A box of serially numbered, opaque, sealed envelopes (Schulz, et al., 1994) was kept by the researcher. Inside were randomly generated,

numbered allocations to either arm of the study and the stickers which indicated group assignment. The researcher wrote the woman's name on the assignment card and placed the allocation envelope at the back of the box for verification of the assignment (Chalmers, et al., 1981).

Upon obtaining informed consent (Appendix B), the researcher thanked the woman for participating in the study and informed her of her group assignment. Women in the control group were informed that they could have clear fluids as tolerated during labour (Appendix C). Women in the experimental group were given a list of fluids they could have during labour (Appendix D). Questions were answered as they arose.

Data collection began with the SF-MPQ (Appendix E). The tool consists of three sub-scales: sensory (words 1-11) and affective (words 12-15) descriptors, the Present Pain Intensity (PPI) and the visual analogue (VAS). The researcher read each descriptor to the woman and asked her to classify it as `none', `mild', `moderate' or `severe'. The researcher recorded her responses, and the scores were summed. For the PPI, the woman was asked to identify the word that most accurately described her pain during contractions from the words that the researcher read to her. The VAS was administered by asking the woman to mark a line on the 70-millimeter scale to denote her pain on the continuum of `no pain' to `worst possible pain'. The size of the space from the `no pain' end of the scale was measured in millimetres. All data were recorded in the allocated spaces on the Data Collection Form (Appendix H).

Figure 2 Progress of subjects through the trial (Begg, et al, 1996)



The woman and her companion, if present, were given instructions for the completion of the Fluid Intake Log (Appendix F) and a pen, if necessary (A companion was not a prerequisite for inclusion in the study). The researcher readministered the SF-MPQ after subsequent vaginal examinations, as pain scores were significantly higher during labour than they were when women quantified the pain of labour on the second or third postpartum day (Lowe and Roberts, 1988). The Fluid Intake Log was reviewed each time the SF-MPQ was administered.

After the birth, the researcher visited the subjects in both experimental and control groups to complete the Labour Agentry Scale (LAS) (Appendix G) and collect relevant data from the chart. The researcher reintroduced herself to the woman and explained the reason for the visit. She explained that the LAS would take approximately 10 minutes to complete, and asked if this was a good time to leave it with her. The researcher stated that the instructions for completion were at the top of the scale and gave the woman time to complete the scale. On returning to pick up the LAS, the researcher checked to ensure that responses to all the statements were recorded. She asked a few additional questions (Appendix H). The woman was thanked for taking time to participate in the study. All data pertaining to one subject were documented on the Data Collection Form (Appendix H).

Data about the woman's labour, delivery and neonatal outcomes were gleaned from the chart and also recorded on the Data Collection Form (Appendix H). The groups were compared with regard to the following occurrences:

- Oxytocin augmentation
- AROM
- Oxygen administration (woman)
- Thick meconium

- Systemic analgesia
- Regional analgesia
- Forceps/vacuum extraction
- Manual removal of placenta
- Third or fourth degree laceration
- Fetal heart rate abnormalities
- Length of labour (first and second stage)
- Caesarean section
- Maternal temp. > 37.8 C
- Intravenous infusion
- 5-minute Apgar < 7
- Evidence of maternal aspiration
- Other

An oral intake history was also obtained (Appendix H) and compared between the groups.

Exclusion and transfer criteria (Tables 5 and 6) were applied at any time during labour, and the woman withdrawn from the study. Data were collected regarding the reason for withdrawal (Appendix H). Secondary outcomes of women who withdrew or were transferred out of the study were compared to those of the women in the study.

A computer software package (Dupont and Plummer, 1994) was used to calculate the sample size. Since the sample size needed to prove causality for aspiration was beyond the scope of this project, a pilot project of 100 subjects was planned to determine the relationship between pain (SF-MPQ) and control (LAS) and oral intake during labour.

Instruments

Labour Agentry Scale (LAS)

The postpartum version of the LAS (Hodnett & Simmons-Tropea, 1987) (Appendix G) was chosen to measure control as experienced by the women in the study. The tool is based on the theory that maintenance of control is a basic need, especially of women in labour. This 29-item scale has undergone extensive psychometric testing.

Inter-item correlation coefficients on the postpartum version of the scale ranged from 0.58 to 0.78. The alpha reliability coefficient was 0.98, indicating high internal consistency (Munro & Page, 1993). Subsequent testing by Hodnett and Osborn (1989a) demonstrated a Cronbach's alpha of 0.95. The LAS was subjected to both factor analysis procedures and dual-scaling techniques. Factor loading ranged from 0.79 to 0.36; one-factor analysis explained 73.7 percent of the total variance, indicating that the LAS is unifactorial for control. Bramadat (1990) administered the LAS 24 to 48 hours postpartum and again at four to six weeks postpartum, documenting an alpha coefficient of 0.96 at six weeks postpartum. When subjected to multiple regression analysis, perception of control during childbirth explained 59 percent of the variability in postpartum satisfaction scores ($P < 0.0001$). The LAS is a reliable and valid instrument of a woman's perception of control during childbirth. It has been shown to be stable over time; therefore, time of completion in relation to childbirth is not critical to the outcome.

Possible LAS scores range from 29 to 203. Higher scores indicate higher perceptions of control. When previously used (Hodnett & Simmons-Tropea, 1987), postpartum LAS scores ranged from 67 to 197 (mean 143.81, SD = 32.05). In Hodnett and Osborn's (1989) study of continuous professional support during labour, mean scores for control and experimental groups ranged from 147.6 (SD = 33.2) to 166.3 (SD = 26.9) with a mean of 151.3 (S.D. 26.4). Mean LAS scores in a randomized clinical trial of induction versus expectant management for rupture of the membranes at term (Hodnett, et al., 1997) ranged from 151.36 (S.D. 30.54) to 155.16 (S.D. 29.13).

Short-form McGill Pain Questionnaire (SF-MPQ)

The conceptualization of pain as a multidimensional experience including affective, sensory and evaluative domains makes the McGill Pain Questionnaire (MPQ) (Melzack, 1975) an ideal tool to evaluate the complex pain of labour. The MPQ has been evaluated for its accuracy in the assessment of labour pain (Melzack, 1975; Melzack, Taenzer, Feldman & Kinch, 1981; Lowe & Roberts, 1988; Lowe, 1989) and takes between five and ten minutes to administer.

Lowe and Roberts (1988) conducted a non-experimental clinical study using the MPQ to determine the congruence between in-labour and postpartum perceptions of pain. The tool was administered during various phases of labour. Results demonstrated that within-subject pain scores were significantly higher during labour than they were on the second or third postpartum day on both the Pain Rating Index (PRI) and Present Pain Index (PPI) subscales ($F(1,19) = 20.67$, $P < .001$ and $F(1,22) = 4.96$, $p = .037$, respectively). Thus, due to the fluctuating nature of labour pain, the MPQ should be administered during each phase and stage of labour, as the woman is able to participate.

The short form of the MPQ (SF-MPQ, Appendix E) (Melzack, 1987) was chosen for use in this study as it takes only two to five minutes to administer. This factor is critical when one remembers that contractions in active labour may occur as frequently as every two minutes, and last up to ninety seconds. The SF-MPQ retains descriptors that measure both the sensory and affective dimensions of pain, the PPI and VAS from the long version of the MPQ. Correlation coefficients between sensory, affective and total scores of both long and short versions of the MPQ for labour pain ranged from 0.51 to 0.82 before intervention to 0.68 to 0.94, $P = .001$ (two-tailed t-test) after intervention for

pain. Both forms demonstrated the ability to detect significant decreases in pain following analgesic administration ($P = 0.001$). Higher scores are indicative of greater pain.

Data Analysis

Statistical analyses using descriptive and inferential statistics were conducted. To determine differences between groups on control (LAS) and pain (SF-MPQ) scores, the one-tailed t-test for independent samples was used. To apply these tests one must assume that the results follow a Normal distribution, and that a difference of greater than two SD's is unlikely to be coincidental (Hassard, 1991). Fisher's measures of skewness and kurtosis were applied to LAS and SF-MPQ scores. Results indicate that the assumptions of normality were met (Munro & Page, 1993). Mean LAS scores for both groups were compared using the one-tailed t-test for independent samples. Chi-square and t-tests were used to analyze data from the secondary hypotheses. Effects of oral intake in labour were analyzed by comparing experimental and control group means.

CHAPTER FOUR – RESULTS

The purpose of this study was to determine whether a restriction in oral fluid intake was related to women's perceptions of control and pain during childbirth.

The primary hypotheses of the study were that:

1. Unrestricted fluid intake during childbirth gives the multiparous woman a greater sense of control;

2. Unrestricted fluid intake during childbirth results in lower perceptions of pain in the multiparous woman.

The secondary hypotheses were that:

3. Length of labour will be shorter in the experimental group (unrestricted fluids);

4. The incidence of interventions will not differ between experimental and control groups;

5. Neonatal outcome will be the same in both groups.

General information

Data collection occurred between April, 1998 and February 1999. During the 124 days of data collection, a total of 62 women were recruited to participate in the study. A total of 267 women qualified for randomization. Fifty-three declined to participate after receiving information about the study (Appendix A). The reasons women gave for not participating are listed in Table 8. One hundred fifty-two women met the criteria for participation in the study, but were not randomized. Table 9 lists reasons that women were not invited to participate. Thirty-nine women (63%) requested a project summary (see Appendix B).

Table 8

Women's reasons for not participating

Reason	Number
• Didn't want to meet someone new/ Didn't want to talk during labour	11
• "Can't think right now"/in active labour	9
• Couldn't define reason/"don't feel like it"/"not interested"	9
• Didn't want to feel forced to do anything during labour	3
• Thought might have emesis/had emesis during previous labour	3
• Migraine headache	1
• Knew someone who had aspirated and died	1
• Unknown	11
TOTAL:	53

Originally, the exclusion criteria (Table 6) did not exclude women who had experienced one previous postpartum haemorrhage or one previous Caesarean section. However, these criteria were added upon discussion with the Department of Anaesthesia,

and tracked to determine the number of women who might have been recruited. Seven women were eliminated due to previous postpartum haemorrhage, and 71 had previous Caesarean sections.

Table 9

Reasons that eligible women were not randomized

Reason	Number
• Previous Caesarean section	71
• Had already received analgesia	27
• In active labour/distressed	29
• Language barrier	8
• Previous postpartum haemorrhage	7
• Unit too busy	5
• Deemed incompetent/inappropriate	2
TOTAL:	152

Although the inclusion criteria excluded women with estimated fetal weights of less than 2500 grams and more than 4000 grams, one baby weighed less than 2500 grams, and twelve babies weighed more than 4000 grams at birth.

Early in the study, two subjects were randomized after they had received epidural analgesia. Data collected from these subjects were eliminated from the final analysis as they had experienced interventions for pain prior to randomization. Five women were

withdrawn from the study (8%). One woman from each group was discharged from the Unit as she was not in active labour. Two women from the experimental group and one from the control group were withdrawn when it was determined that they needed Caesarean sections: one for failure to progress, one for compound presentation and one for an undiagnosed breech. The fetal presenting part was documented as "- 3" station on admission to the study in these three subjects.

The study group comprised 60 women, ranging in age from 19 to 42 years. Table 10 compares study participants on age, gravida, parity and gestational age. There were no statistically significant differences between the groups using two-tailed t-tests. Twenty-three women were assigned to the control group, and thirty-two to the experimental group. Data from the five women who were withdrawn from the study were not included in the analyses.

Table 10

Characteristics of study participants *

Group	Age	Gravida	Para	Gest. Age
	(mean/mode)	(range/mode)	(range/mode)	(mean/SD)
Control: (n = 23)	27.5 (29)	2 - 8 (2)	1 - 4 (1)	40-40+ (1.3)
Experimental: (n = 32)	30.0 (28)	2 - 5 (2)	1 - 4 (1)	39-39+ (1.4)

* the withdrawn group was not included in the statistical analysis due to the small sample size
Statistical Analysis: Age: $t(52) = 1.64$, n.s.; Gravida: $t(53) = 1.66$, n.s.; Para: $t(53) = 1.39$, n.s.; Gestational Age: $t(53) = 1.48$, n.s.

Despite differing restrictions regarding oral intake during labour, the control and experimental groups consumed similar volumes of fluids (Table 11). The groups were also comparable on the frequency with which they consumed fluids. Thirteen women (41%) in the experimental group took no milk-based fluids, and eleven women (34%) took milk-based fluids only once.

Table 11

Total fluid intake by group (amount and frequency) *

Group	Amount (mL)		Frequency	
	Mean	SD	Mean	SD
Control	635	332	6.05	4.9
Experimental	506	479	5.39	3.6

* Statistical Analysis t(52) = .65, n.s. t(50) = .56, n.s.

Primary Hypotheses: Control and pain

Hypothesis 1. Unrestricted fluid intake during childbirth gives the multiparous woman a greater sense of control

LAS scores in the experimental group were not significantly different from those in the control group, t(51) = -.70, n.s. (Table 12). Since the values for Fisher's tests of skewness and kurtosis were within ± 1.96 a Normal distribution may be assumed (Munro & Page, 1993). Possible LAS scores range from 29 to 203 (Hodnett & Simmons-Tropea, 1987). Scores in this study ranged from 83 to 148 with a mean of 117.79 (SD 14.71). The mean scores in this study were 116.17 (SD 11.15) for the control group and 119 (SD 17.03) for the experimental group.

Table 12

Comparison of study groups on Labour Agentry Scale *

Group	Range	Mean	SD	Mode	Skewness	Kurtosis
Control (n = 23)	99 - 137	116.2	11.15	126	- .13	-1.07
Experimental (n = 32)	83 - 148	119.0	17.03	126	- .53	- .45

Note: Two cases from the experimental group with missing data were not included in the analysis
* t (51) = -.70, n.s.

Hypothesis 2 Unrestricted fluid intake during childbirth results in lower perceptions of pain in the multiparous woman.

Perceptions of pain during labour were measured by the SF-MPQ. This tool consists of four subscales: sensory, affective, Present Pain Index (PPI) and a Visual Analog Scale (VAS). Participants categorized the 12 words in the sensory scale and the four words in the affective scale as "none", "mild", "moderate" or "severe". Over all, the scores for the sensory scale ranged from 0 to 33. The scores for the affective scale ranged from 0 to 12. For the PPI, the scores ranged from 0 to 5. Women chose between "no pain", "mild", "discomforting", "horrible" and "excruciating". The VAS scores ranged from 0 to 51. Women placed a mark across a 70-millimetre line between poles labeled 'no pain' and 'worst possible pain'.

All sixty women in the study completed the SF-MPQ on enrollment. Following subsequent vaginal examinations forty-three and twenty-one women completed the SF-MPQ for a second and third time, respectively. Eight women completed the SF-MPQ

four times, and only three finished it five times. Due to small sample sizes, the SF-MPQ scores obtained after the fourth and fifth vaginal examinations were not analyzed.

T-tests were carried out to compare SF-MPQ subscale scores for the control and experimental groups at times 1, 2 and 3. There was a statistically significant difference between the experimental and control groups only on the SF-MPQ Affective subscale at Time 1 (Table 13). The instrument did reflect higher pain scores as cervical dilation increased. These scores were graphed to illustrate the similarities and differences between the two groups (Figures 3 - 7).

Table 13

Comparison of SF-MPQ scores at Times 1, 2 & 3

	SF-MPQ Subscales *	GROUP	N	Mean	SD	SE	t-test
	SENSORY1	control	23	7.09	4.73	.99	t(53) = .14, n.s.
T		experimental	32	6.91	4.82	.85	
i	AFFECTIVE1	control	23	1.96	1.82	.38	t(53) = 1.78, p=.04
m		experimental	32	1.10	1.73	.31	
e	S_A_TOT**1	control	23	9.00	6.01	1.25	t(53) = .64, n.s.
		experimental	32	7.97	5.77	1.02	
1	PPI1	control	23	1.61	.94	.20	t(53) = .28, n.s.
		experimental	32	1.69	1.06	.19	
	VAS1	control	23	15.91	12.79	2.67	t(53) = 1.05, n.s.
		experimental	32	20.19	16.11	2.85	
T	SENSORY2	control	17	11.65	6.86	1.67	t(41) = 1.08, n.s.
i		experimental	26	9.38	6.62	1.30	
m	AFFECTIVE2	control	17	3.35	2.47	.60	t(41) = 1.08, n.s.
e		experimental	26	2.42	2.93	.57	
	S_A_TOT2	control	17	15.00	8.73	2.12	t(41) = 1.19, n.s.
2		experimental	26	11.69	8.99	1.76	
	PPI2	control	17	2.65	1.41	.34	t(41) = 1.24, n.s.
		experimental	26	2.19	.98	.19	
	VAS2	control	16	33.06	19.48	4.87	t(40) = 1.24, n.s.
		experimental	26	31.44	14.75	2.89	
T	SENSORY3	control	10	13.60	10.04	3.17	t(19) = .42, n.s.
i		experimental	11	11.82	9.36	2.82	
m	AFFECTIVE3	control	10	3.20	2.82	.89	t(19) = .55, n.s.
e		experimental	11	4.00	3.77	1.14	
	S_A_TOT3	control	10	16.90	12.35	3.91	t(19) = .20, n.s.
3		experimental	11	15.82	12.32	3.71	
	PPI3	control	10	2.20	1.14	.36	t(19) = 1.07, n.s.
		experimental	11	2.82	1.47	.44	
	VAS3	control	10	31.45	22.02	6.96	t(19) = .71, n.s.
		experimental	11	38.14	21.32	6.43	

* Suffix 1 = Time 1; Suffix 2 = Time 2; Suffix 3 = Time 3

** S_A_TOT is the total of sensory and affective subscales

Figure 3 Comparison of groups on SF-MPQ Sensory subscale ratings over Time

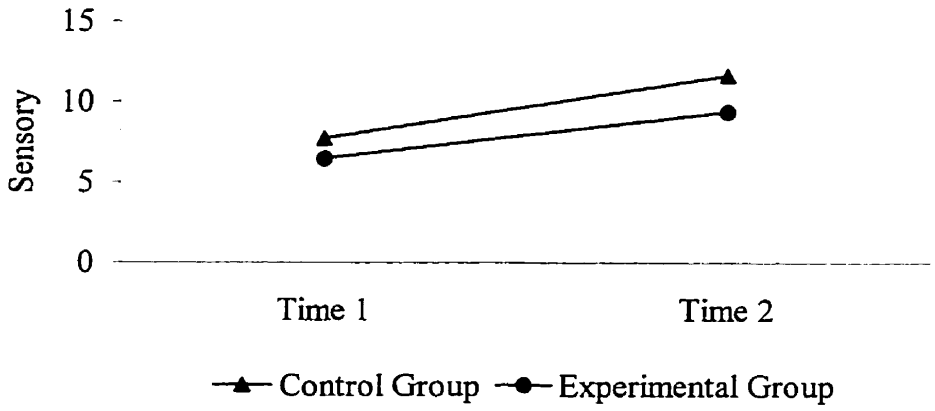


Figure 4 Comparison of groups on SF-MPQ Affective subscale ratings over Time

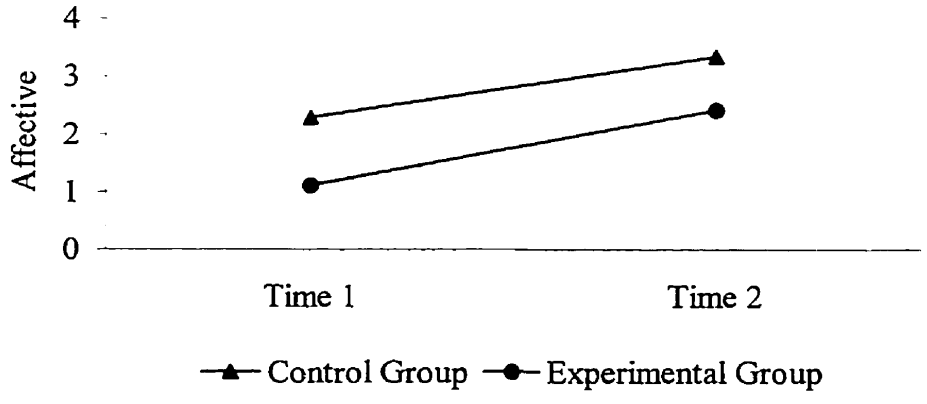


Figure 5 Comparison of groups on SF-MPQ Total (Sensory and Affective) ratings over Time

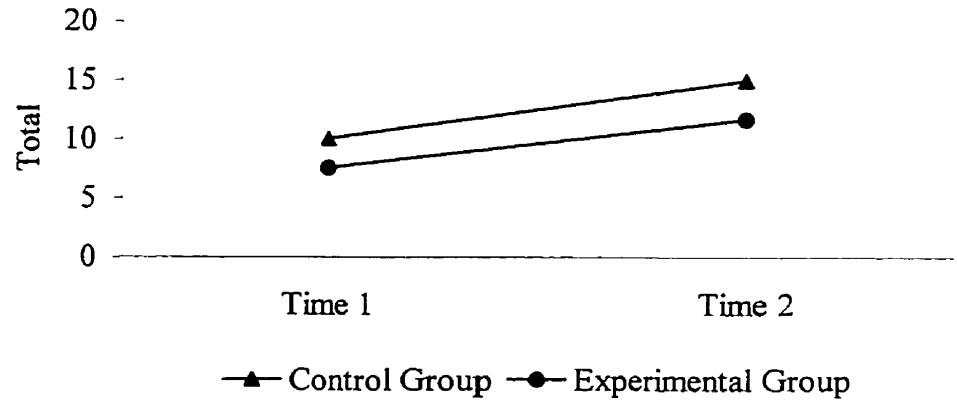


Figure 6 Comparison of groups on Present Pain Index (PPI) over time

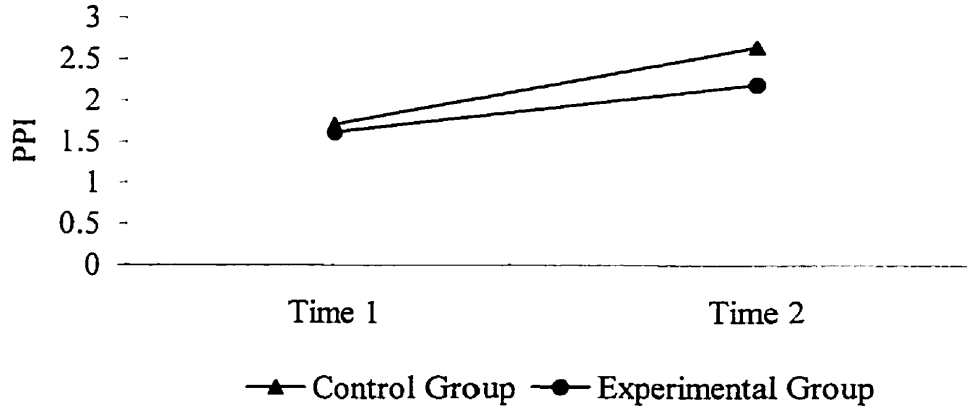
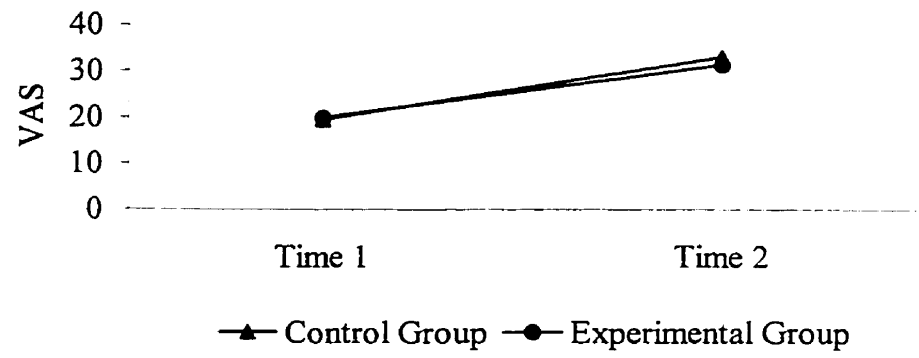


Figure 7 Comparison of groups on the Visual Analog Scale (VAS) over time



Secondary Hypotheses: Length of labour, Incidence of interventions, Neonatal outcome

Hypothesis 3 Length of labour will be shorter in the experimental group (unrestricted fluids)

After testing for uniformity of variances and normality, the two groups were compared using a one-tailed t-test for independent samples. There was no significant difference between the two groups when length of labour was compared (Table 14).

Table 14

Length of labour in minutes (hours) *

Group	Range	Mean	SD
Control	158-1304 (2.6-21.7)	448 (7.5)	270 (4.5)
Experimental	125-1344 (2.1-22.4)	476 (7.0)	276 (4.6)

* $t(2) = .37$, n.s.

Hypothesis 4 The incidence of interventions will not differ between experimental and control groups

The study groups were compared on fifteen interventions (Table 15). The number of interventions experienced by women ranged from none to nine. Analgesia was the most common intervention; fifty-two women (95.5%) received systemic and/or regional analgesia. Twenty-two women (40%) experienced artificial rupture of membranes.

The total number of interventions was not significantly different between the two groups (Table 16). Only five subjects, two in the control group and three in the experimental group, experienced no interventions. There was no statistical difference between the groups regarding the mean number of interventions each experienced.

Table 15

Number of interventions per group (%)

	Control	Experimental
Regional analgesia	12 (52)	19 (59)
Systemic analgesia	8 (35)	13 (41)
Artificial rupture of membranes	10 (43)	12 (37)
Fetal heart rate abnormalities	4 (17)	6 (19)
Forceps/vacuum assisted birth	2 (9)	4 (12)
Caesarean section	1 (4)	2 (6)
Oxygen administration (maternal)	0	3 (9)
Oxytocin augmentation of labour	1 (4)	1 (3)
Intravenous infusions	1 (4)	1 (3)
Third or fourth degree lacerations	0	1 (3)
Presence of thick meconium	0	1 (3)
Manual removal of placenta	0	0
Maternal temperature >38C	0	0
Maternal aspiration	0	0
Other	0	1 (3)

Table 16

Significance of interventions by group *

	Total interventions			
	None	Two or less	More than two	Total
Control	2	16	5	23
Experimental	3	23	7	32

* $\chi 2\ (2) = 0$, n.s.

Hypothesis 5 Neonatal outcome will be the same in both groups

An Apgar score of less than seven at five minutes was used as the sole indicator of neonatal outcome. No incidents of neonatal compromise were identified in either group as there were no recorded Apgar scores lower than 7.

Qualitative data

On completing the LAS, the women in both the experimental and control groups were asked three questions. Their responses are described in the ensuing paragraphs.

Question 1. What did you have to eat or drink before you came to the Hospital? When?

There were no differences in food intake patterns between the two study groups. The oral intake ranged from clear fluids (e.g. "water", "juice", "Slurpee") to full meals (e.g. "very big breakfast", "full supper", "hashbrowns and egg McMuffin"). Some women had nothing to eat or drink for 24 hours prior to admission; others had eaten en route to the hospital.

Question 2. Did you follow the protocol you were assigned to for oral intake during labour? If not, why not?

Fifty women stated that they had followed the protocol they were assigned to during labour. Five women, all in the experimental group, stated that they had not. Their explanations were as follows:

- Sleepy (due to systemic analgesia), and the nurse limited intake at the end.
- Didn't feel like eating.
- Contractions were too fast.
- "I snuck in a chocolate bar, 6 chips and a couple of bites of my boyfriend's sandwich".
- Full tray was ordered, but never delivered.

These women were not eliminated from the analysis as they were offered a choice about oral intake within their assigned group.

Question 3. Do you have any other comments you would like to make?

Eighteen women, ten in the control and eight in the experimental group made no further comments about the study. The comments made by the remaining thirty-seven women were categorized into five themes: control and choice, comfort or discomfort, the study, labour or pain and eating or drinking.

Thirteen women, three from the control group and ten from the experimental, commented about control or choice. One woman in the experimental group stated, "I was really quite happy to be able to make the choice of what to drink even though I didn't drink very much". Another woman noted, "It was nice to be able to have stuff. It gives

you a little more control". One woman in the control group stated, "I would have liked to have eaten - I was hoping I would be in the eating group".

Nine women commented on the comfort or discomfort they experienced. A woman in the experimental group noted, "I felt a little bit nauseous after I ate the milk-based fluids. It was better, though, because I felt full afterwards". One woman in the control group emphatically stated, "I wanted to eat - I was starving!"

Eight women made comments directly relating to the study. One woman in the control group stated, "When you're in labour and have pain it is hard to answer the questions". Several women in the both groups stated that they were glad to help and expressed interest in the topic of the study with comments like, "I hope I helped" and "I hope this brings you good luck ~ I was glad to be able to help".

Labour or pain related comments were made by four women. One woman in the control group noted, "It seemed my body just shut down and didn't need anything after awhile". A woman in the experimental group stated, "I didn't eat at all last time and I think I had more pain".

Two women offered opinions about eating or drinking during labour. One woman in the control group said, "I think it's better not to eat when you're in labour". A woman in the experimental group stated, "There's no difference between drinking and not drinking".

Summary

Data were collected from sixty women who were randomly assigned to clear or milk-based fluid intake during labour. Five women were withdrawn from the study. The remaining fifty-five women demonstrated comparable perceptions of control and pain

regardless of group assignment. Thus, the primary hypotheses of the study were not supported by the data.

There were no statistically significant differences in the length of labour, number of interventions and neonatal outcome between the control and experimental groups. Of the secondary hypotheses, the hypothesis that the length of labour would be shorter in the experimental group was not supported. The hypotheses that the incidence of interventions and neonatal outcomes would not differ were supported. The comments of study participants formed an important part of the data. Subjects demonstrated that they think about oral intake both before and during labour.

CHAPTER FIVE - DISCUSSION

Although many variables influence perceptions of control and the intensity and severity of pain during labour, the assumption of the RCT design is that the distribution of contributing variables is the same in both the experimental and control groups. A review of the literature suggested the appropriateness of directional hypotheses (Munro & Page, 1993) to compare multiparous women's perceptions of control and pain as they relate to oral intake during labour.

Data for the study were gathered in a busy tertiary care teaching hospital in Winnipeg, Manitoba. The hospital is one of two tertiary centers offering obstetric services in the city, and admits both low and high risk women from a variety of ethnic, racial, linguistic and sociodemographic communities.

Recruitment

Recruitment of participants to the study was slower than expected. The researcher was available for a total of 124 days for the 62 subjects recruited to the study. Another 53 women declined the invitation to participate. Twenty-three percent of eligible women chose to participate.

The time required to recruit subjects and the number of women who chose not to participate merits consideration. Hunninghake, Darby and Probstfield (1987) suggested that eligibility criteria and willingness to participate would reduce the enrolled population to less than 10% of the original expected number. Pletsch, Howe and Tenney (1995) encountered a participation rate of less than 24% in a study of smoking cessation in pregnant Latina women.

Although the lag in recruitment was recognized early, the strategies proposed to improve enrollment proved unacceptable. Visiting prenatal classes was considered but few multiparous women enrolled in them. The University Ethics committee discouraged the use of research assistants. Finally, visits to physicians' offices were unacceptable as the researcher could not guarantee availability when recruited women were admitted to the hospital in labour. In future, broader recruitment strategies should be used to enhance participation in studies of oral intake during labour.

Sense of control

Although women in the experimental group had greater choice in the fluids that they consumed, 41% chose not to exercise their option. This may be related to entering the active phase of labour. One woman stated, "It (the labour) was too fast to drink anything". Two women stated that they did not follow the protocol they were assigned because they "didn't feel like eating" and the "contractions were too fast". In addition nine women were not randomized as they were in active labour or couldn't "think right now". One woman in the control group stated, "It seemed my body just shut down and didn't need anything after awhile".

In early labour, however, women wanted to eat. One woman in the control group stated, "I would have liked to have eaten ~ I was hoping I would be in the eating group". Others said, " Everything went well, but I would have liked ice cream", and "I wanted to eat ~ I was starving!" Several women in the experimental group wished that they could have participated in the study longer. One woman in the experimental group "snuck in a chocolate bar, 6 chips and a couple of bites of my boyfriend's sandwich" because she was hungry during early labour.

Women limit their own intake as labour progresses (Newton & Champion, 1997; O'Reilly, Hoyer & Walsh, 1993; Roberts & Ludka, 1993). Novak and Broom (1995, p. 181) note that as labour progresses the woman's attention is "increasingly focussed on meeting the demands of labour". Evidence from this study corroborates that women intuitively limit their intake during the active phase of labour.

The mean LAS scores in this study are low when compared with means from studies conducted by Hodnett and Osborn (1989b) and Hodnett and colleagues (1997). In studies conducted in teaching hospitals in Toronto and abroad LAS scores for control groups were 147.6 (SD 32.05) and 151.36 (SD 30.54), and 166.3 (SD 26.9) and 155.6 (SD 29.13) for experimental groups. In this study, howevr, the means were only 116.2 for the control group and 119 for the experimental group. Since higher LAS scores are associated with a greater perception of control, these scores may reflect that women giving birth in the study setting experienced little control over their environment or participation in decisions regarding their care.

Women, however, stated that control over oral intake was important to them. One woman in the experimental group stated, "I was really quite happy to be able to make the choice of what to drink even although I didn't drink very much". Another noted, "It was nice to be able to have stuff. It gives you a little more control". Women in the control group commented, "I would have liked to have eaten ~ I was hoping I would be in the eating group" and "I wish I could have had a milkshake". Reflecting the need to control body functions, one woman in the control group stated, "It's nice to know that I can eat or drink without thinking I would poop myself or pee on the doctor". These comments were similar to those elicited by Newton and Champion (1997).

It was noted clinically that many study participants experienced induction of labour. This is corroborated by the fact that 21 (35%) study participants reached 41 - 41+ weeks gestation and reflects the practice within the hospital of inducing labour at this gestational age. This, too, may negatively influence subjects' perceptions of control (Butani & Hodnett, 1980).

The literature suggests (Crawford, 1988; Rooks, et al, 1989; Roberts & Ludka 1993; O'Sullivan, 1994; Bogod, 1995; Newton & Champion, 1997) and comments from the participants in this study verify that women can, should and want to make their own decisions about eating or drinking during labour. Hospitals that ascribe to a philosophy of "woman-centred care" should involve women in the development of policies that influence care during labour. A larger study is needed to determine whether a relationship exists between oral intake during labour and women's perceptions of choice and control.

Perceptions of pain

Pain is a multidimensional experience. In this study, only the SF-MPQ affective subscale score differed significantly between the study groups and only on enrollment in the study (Time 1). The four words used to assess the affective dimension of pain are "tiring-exhausting", "sickening", "fearful", and "punishing-cruel".

The SF-MPQ was administered after women had signed the consent and been informed of their group assignment. It may be that the women in the control group experienced stress as a result of group assignment. Women in the control group commented, "I was hungry" and "I would have liked to have eaten ~ I was hoping I would be in the eating group." Conversely, women in the experimental group said, "I

was glad they let me eat" and "It was actually pretty cool to be in the study and be able to eat". This effect disappeared in subsequent administrations of the instrument as women became accustomed to their assignment and received reassurance from the nurses that they were receiving standard care.

Beynon (1988) suggests that women, if allowed to control their behaviour during labour, can minimize their perceptions of pain. The multidimensional nature of pain is such that the availability of milk-based fluids for women during labour was not sufficient to demonstrate a significant difference in perceptions of pain. In commenting about the pain of labour, one woman in the experimental group noted, "Labour was extremely painful". However, another said, "I didn't eat at all last time and I think I had more pain". Still another stated, "There's no difference between drinking and not drinking". No women in the control group made statements that directly related to the pain of labour. In addition, the high incidence of systemic and regional analgesia experienced by women in the study can influence pain scale ratings (Melzack, 1987).

Length of labour

It was hypothesized that the length of labour would be shorter in the experimental group. However, no significant differences were noted in length of labour. In this study the mean length of labour for women in this study was 462 minutes (7.7 hours). This is longer than the mean length of labour for multiparous women suggested by Kilpatrick & Laros (as cited in Cunningham, et al. 1993) and Cassidy (1993). Simkin (1986a) suggested that the length of labour might be increased by the stress of pain. The same author subsequently (1986b) reported those women found the restriction of oral intake moderately to severely stressful. Study findings may also reflect the work of Lederman

and colleagues (1985) who demonstrated that women who experienced anxiety had higher serum epinephrine and norepinephrine levels and longer early labours.

Incidence of interventions

Only five subjects, two in the control group and three in the experimental group, experienced no interventions. These data suggest that interventions are common in the study setting. When compared with the philosophy documented by Haire and Elsberry (1991), the study setting does not demonstrate use of a non-interventionist approach to care. This may be an example of the "maximin strategy" described by Brody and Thompson (1981) in that many women are receiving interventions regardless of the likelihood of the need for the intervention and without documented evidence that they improve maternal or neonatal outcomes.

In this study, 94.5% of women received analgesia. Thirty eight percent had narcotics and/or nitrous oxide (systemic analgesia) and 56% had epidurals (regional analgesia). In the study setting, 49% of women giving birth were given epidurals during labour during the eleven months ending in February 1999 (unedited data, St. Boniface General Hospital, March 9, 1999). Forty-four percent received (systemic analgesia). How many women received both systemic and regional analgesia in the study setting is not documented. Klein (1984) and Carroll (1991) and colleagues demonstrated that low-risk women in a high-risk environment suffered rates of intervention comparable to those experienced by women who needed them. In contrast, Haire and Elsberry (1991) found that, in the North Central Bronx Hospital, only 13% of women had analgesia during labour. This may reflect a difference in philosophy of care, that is, birth viewed as a

potentially presurgical state versus as a normal process. The high analgesia rates in the study may also reflect the availability of the intervention in the study setting.

Neonatal outcome

Despite having parameters for estimated fetal weight in the inclusion criteria (Table 3.1), 13 newborns (24%) were over or under the desired weight. No newborns had Apgar scores of less than seven at five minutes. However, the incidence of poor neonatal outcomes is so small that they are unlikely to have occurred in a study of this size. In future, this measure of neonatal outcome should be augmented with more comprehensive observations of neonatal neurological or physical status.

Study Limitations

It is common knowledge that the RCT is the "gold standard" for clinical research. The results obtained from an open study are less robust than those of a double-blind study. However, a non-blinded RCT is more objective than an observational or retrospective study.

The number of withdrawals from a study may limit its value. A withdrawal rate of more than 10% jeopardizes the value of randomization and warrants scrutiny (Chalmers, et al., 1981). Although the withdrawal rate was eight percent in this study, it still poses a limit on the outcome due to the small sample size. The potential withdrawal rate was minimized by pre-study education of health care providers and clinical support during data collection. The results of this study cannot be generalized to all women in labour. However, they may support further research with other groups (e.g. primiparous women) or other interventions (e.g. food during labour) to examine the perception of control and minimize pain during labour.

This study was limited by several factors. Although originally planned for 100 subjects, the sample size was reduced to 60 to accommodate the constraints of time and difficulties in sample recruitment. Thus, any outcomes demonstrated by analysis of the findings cannot be generalized to other groups.

The experimental intervention was similar to the control treatment. Despite endorsement by the literature that women eat lightly during labour (Roberts & Ludka, 1993; Haire & Elsberry, 1991; Crawford, 1988; Ludka, 1987), this study was designed to compare responses between clear and milk-based fluids. This limited the potential of the study to demonstrate the differences between two protocols in the care and outcomes of women who participated.

The nurses on the Labour and Delivery Unit were supportive of the research, and enthusiastic about being involved in a study that they considered relevant to their practice. They were disappointed to be denied the opportunity to participate as research assistants. This limited the number of subjects that could be enrolled in the study to when the researcher was available, and extended the period of time required to collect the data but decreased experimenter bias.

The recording of sociodemographic data would have enabled comparisons of clientele with other centers that have published literature about oral intake during labour. This might have added to the body of knowledge as it relates to oral intake during labour.

The study of normal labour in a high-risk setting is less than ideal as healthy women in normal labour experience more interventions than are warranted (Klein, et al, 1984; Carroll, Reid, Ruderman & Murray, 1991). Repeating this study in a community hospital setting with a restrictive oral intake policy might elicit different results.

Implications for practice and research

Time and workload can pose barriers to the research required for the development of evidence-based policies in the clinical setting (Mayberry, 1994). This paper provides documentation to support a change in one policy, serving as an example of the relevance of research to practice.

It would be valuable to evaluate future changes in the oral intake during labour policy prospectively to determine what effects, if any, would be demonstrated by a more liberal approach to eating and drinking during labour (Newton and Champion, 1997). Comparison of the present policy for oral intake with a policy similar to those developed in other centers would create the potential for larger treatment effects.

The nurses on the Labour and Delivery Unit spoke of the relevance of this study to their clinical practice, citing that they adapt their care regarding oral intake to the philosophy of the on-call anaesthesiologist. This provides evidence that the intent of the policy, that is to provide a consistent standard of care, is not being met. Nurses noted how difficult it is to deny food to the women in their care when they are hungry and in early or normal labour. They identified that a similar study might benefit primiparous women as they have longer labours. Clinical nurses should be involved in setting direction and collecting data for future studies of oral intake during labour and childbirth.

Nurses, as patient advocates, should lobby for and participate in changing oral intake policies. They should encourage women to follow their body's cues to eat and drink during labour. In addition, they should educate women about oral intake before labour commences. This is supported by a woman in the experimental group who stated, "I didn't eat this morning because I didn't think I should ~ I'd been told it wasn't a good

idea". Another in the control group stated, "I think it's important that people find out the options of what they can do during labour ahead of time".

Additional research with a larger sample size, perhaps a multicenter study, is warranted to more fully examine the influence of oral intake during labour.

Implications for policy development

A Labour and Delivery Unit that accommodates both low and high-risk women would do well to critically evaluate policies for their applicability to both groups. Enforcement of a restrictive oral intake policy is inappropriate unless there is documented evidence that the woman is at risk for operative birth under general anaesthetic. The involvement of nurses and other practitioners who understand the different needs of low and high-risk women in policy development is paramount to appropriate care. Finally, the active participation of women who have used the Unit to guide policy development would ensure that policies address the combined issues of safety in the practice setting and help create an environment where women feel supported during their labours.

The environment in which a woman labours influences the process of labour and birth. Caregivers in a high-risk setting need to examine whether controlling labour by the use of technology is deemed more acceptable than demonstrating caring by being sensitive to the needs of labouring women and supporting them through this stage of development. Managers may need to help caregivers to share power and control with women in labour.

Conclusion

The results of this study did not reveal differences in perceptions of control and pain between two groups of multiparous women. More importantly, they are incongruent

with the literature. A restrictive policy for oral intake during labour does not reflect the evolution of anaesthetic technique from 1946 to the present. Thus, basing clinical practice on the best available evidence should result in a change in philosophy that reflects the normalcy of childbirth for a healthy woman. The subsequent change in oral intake policy should include consumers in its development, afford women choice regarding oral intake during labour and encourage women to follow their body's instincts. Although the risks of aspiration in the course of a general anaesthetic during childbirth should not be ignored, the literature suggests that a restrictive policy may do more harm than good. To base policy on fear, opinion or tradition rather than on available evidence is at best foolish, and at worst, negligent.

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Appendix A

Invitation to Participate

Dear prospective mother ~

I am a Registered Nurse who is enrolled in the Master of Nursing program at the University of Manitoba. I am doing a study about drinking fluids during labour. This study has been approved by the Ethical Review Committee of the Faculty of Nursing and the Nursing Research Office at the St. Boniface General Hospital Research Centre.

I am asking you to take part in a study that will compare liberal and limited drinking during labour. If you choose to participate, you will be assigned by chance to one of two groups: either you will be expected to follow a policy that limits the type and amount of fluids you drink during labour, or you will be encouraged to drink whatever you wish during labour. At this time, the practice at St. Boniface Hospital is that women are allowed "clear fluids only during labour". The risks of developing complications related to drinking during labour are small. In the past, a small number of women developed pneumonia-like symptoms if stomach acids were inhaled into the lungs (aspiration). Some women, as a result of not drinking, have experienced other discomforts during labour.

If you decide to participate, I will ask you questions regarding your pain for two to five minutes when you enter the study and after every vaginal examination during your labour. You (or your labour companion) will be asked to record all the fluids you drink. After your baby is born I will visit you again to ask questions about how you felt during your labour and birth. This will take about 15 minutes. Depending on the number of vaginal examinations you have, your involvement will take a total time of 20 - 40

minutes. In addition, I will gather information about your labour and delivery from your chart.

If, at any time, you wish to end your participation in the study, you may do so without penalty. No one will pressure you to try to stay in the study and the care you receive will not change. In addition, if unexpected problems arise a doctor may withdraw you from the study. The collected data will be available only to the Thesis committee, the statistical consultant and myself. The results will not be linked to your name in any way.

Thank you for this opportunity to learn more about the care of women during labour. Please let your nurse know whether or not you wish to participate. You will be asked to sign a consent to participate in the study. If you would like to have a summary of the study results, please fill out the information below the dotted line on the Consent.

If you have any questions, or wish to discuss this further, I will come speak to you. If you think of any questions during labour, they will be answered as well. If you prefer, you may contact a member of my Thesis committee for further detail or clarification:

Dr. Annette Gupton ph. 474-6220

Dr. Diane Biehl ph. 789-3321 or 237-2580

Sincerely,

Florence Klassen, RNC, BSN

Appendix B

Consent to Participate

I have decided to participate in a research project that compares limited and unlimited drinking of fluids during labour conducted by Florence Klassen, a Master of Nursing student at the University of Manitoba. I know that participation in this project is entirely voluntary; I am under no obligation to do so. By signing below, I am consenting to be a part of the study. The study has been reviewed and approved by the Ethical Review Committee of the Faculty of Nursing and the Nursing Research Office at the St. Boniface General Hospital Research Centre.

Florence Klassen or a research assistant will conduct the interviews. They will involve questions about my pain during labour, and my feelings about my labour and birth. My total involvement, depending on the number of vaginal examinations during labour will be about 20-40 minutes. Information about my labour and birth will be recorded from my chart. All information will be kept confidential. My name will not be linked with the results of the study. The information will be securely locked, and kept for ten years and then destroyed.

I will be assigned by chance to one of two groups: either I will be expected to follow a policy that limits the type and amount of fluids I drink during labour, or I will be encouraged to drink whatever I wish during labour. At this time, the practice at St. Boniface Hospital is that women are allowed "clear fluids only during labour". The risks of developing complications related to drinking during labour are small. In the past, a small number of women developed pneumonia-like symptoms if stomach acids were

inhaled into the lungs (aspiration). Some women, as a result of not drinking, have experienced other discomforts during labour.

I have read the Invitation to Participate, and have had an opportunity to have all my questions answered.

I have been offered a copy of the summary of the project.

Date: _____

Signature: _____

Interviewer: _____

Name: _____

Address: _____

_____

Appendix C

St. Boniface General Hospital Guidelines for Oral Intake in Labour

GUIDELINES

ORAL INTAKE IN LABOUR

COVERAGE:

Parturients in active labour.

GUIDELINE:

1. A parturient in active labour may drink clear fluids as tolerated unless otherwise ordered by the anesthetist on duty.

2. Patients at higher risk for Cesarean delivery such as:

   (i) multiple gestation
   (ii) presentation other than vertex
   (iii) gestational age <32 weeks
   (iv) severe pre-eclampsia

   should have nothing per mouth including no ice chips (NPO).

3. Individual cases should be discussed with anesthetist in charge.

APPROVED: Obs/Gync Perinatal Medical Nursing Liaision Committee Meeting - May 2, 1996

Dr. R. Wahba
Section Head, Obstetrical Anesthesia

Barb Petrowski
Barb Petrowksi
Acting Director, Maternal Child Nursing

Dr. M. Helewa
Section Head, Clinical Obstetrics

N. H. Craven
Dr. N. Craven
Section Head, Family Practice Obstetrics

Effective Date: MAY 2ND, 1996
Last Reviewed: APRIL 4TH, 1996

Appendix D

Fluids you may have during labour

- clear fluids such as water, juices, tea,
  Gatorade, broth soups, Jell-O, sorbet
- milk-based fluids such as milk,
  milk puddings, milk-based soups, ice cream

Appendix E

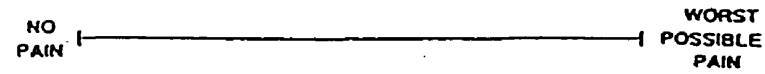
Short Form-McGill Pain Questionnaire

SHORT-FORM McGILL PAIN QUESTIONNAIRE

RONALD MELZACK

PATIENT'S NAME: _____ DATE: _____

	NONE	MILD	MODERATE	SEVERE
THROBBING	0) _____	1) _____	2) _____	3) _____
SHOOTING	0) _____	1) _____	2) _____	3) _____
STABBING	0) _____	1) _____	2) _____	3) _____
SHARP	0) _____	1) _____	2) _____	3) _____
CRAMPING	0) _____	1) _____	2) _____	3) _____
GNAWING	0) _____	1) _____	2) _____	3) _____
HOT-BURNING	0) _____	1) _____	2) _____	3) _____
ACHING	0) _____	1) _____	2) _____	3) _____
HEAVY	0) _____	1) _____	2) _____	3) _____
TENDER	0) _____	1) _____	2) _____	3) _____
SPLITTING	0) _____	1) _____	2) _____	3) _____
TIRING-EXHAUSTING	0) _____	1) _____	2) _____	3) _____
SICKENING	0) _____	1) _____	2) _____	3) _____
FEARFUL	0) _____	1) _____	2) _____	3) _____
PUNISHING-CRUEL	0) _____	1) _____	2) _____	3) _____



PPI

0	NO PAIN	_____
1	MILD	_____
2	DISCOMFORTING	_____
3	DISTRESSING	_____
4	HORRIBLE	_____
5	EXCRUCIATING	_____

Appendix F
Fluid intake log

Trial #: _____
Date: _____

Please record the time, type of fluid (e.g. clear soup, ice chips, etc) and amount*

Time (a.m./p.m.)	Type of fluid	Amount *

* Please record amounts as 'sips', 1/2 Styrofoam cup, 1 Styrofoam cup, etc.

Please Turn Over >>>>

Time (a.m./p.m.)	Type of fluid	Amount*

Please record amounts as `sips', 1/2 styrofoam cup, 1 styrofoam cup, etc

Appendix G

Labour Agentry Scale

Childbirth Feelings Scale

Just as no two women are exactly alike, no two women have exactly the same experiences during labour. Please try to recall your labour as vividly as you can. Think about your feelings during labour. Of course, you probably had many different feelings, but try to remember what it was generally like for you during this time.

Here is how to fill out this form:

For example, the first statement is "I felt confident". If you felt confident **all or almost all of the time**, place your "X" in the space closest to "Almost Always":

1. I felt confident

Almost Always							Rarely
_x_	____	____	____	____	____	____	
7	6	5	4	3	2	1	

If you felt confident **a lot of the time, but not almost always**, place your "X" in the second space near "Almost Always":

1. I felt confident

Almost Always							Rarely
____	_x_	____	____	____	____	____	
7	6	5	4	3	2	1	

If you felt confident **a little more than half the time**, place your "X" in the third space near "Almost Always":

1. I felt confident

Almost Always							Rarely
____	____	_z_	____	____	____	____	
7	6	5	4	3	2	1	

Please go on to the next page....

If you felt confident **about half the time**, place your "X" in the middle space:

1. I felt confident

Almost Always								Rarely
	7	6	5	x 4	3	2	1	

If you felt confident **slightly less than half the time**, place your "X" in the third space near "Rarely":

1. I felt confident

Almost Always								Rarely
	7	6	5	4	x 3	2	1	

If you **sometimes** felt confident, place your "X" in the second space near "Rarely":

1. I felt confident

Almost Always								Rarely
	7	6	5	4	3	x 2	1	

If you **never or almost never** felt confident, place your "X" in the space closest to "Rarely":

1. I felt confident

Almost Always								Rarely
	7	6	5	4	3	2	x 1	

Please try to rate each statement independently of how you rated the other statements. Thank you very much for taking the time to do this.

1. I felt confident

Almost Always ___7 ___6 ___5 ___4 ___3 ___2 ___1 Rarely

2. I felt defeated

Almost Always ___1 ___2 ___3 ___4 ___5 ___6 ___7 Rarely

3. I felt important

Almost Always ___7 ___6 ___5 ___4 ___3 ___2 ___1 Rarely

4. I felt tense

Almost Always ___1 ___2 ___3 ___4 ___5 ___6 ___7 Rarely

5. I had a sense of understanding what was happening

Almost Always ___7 ___6 ___5 ___4 ___3 ___2 ___1 Rarely

6. I felt insecure

Almost Always ___1 ___2 ___3 ___4 ___5 ___6 ___7 Rarely

7. I felt relaxed

Almost Always ___7 ___6 ___5 ___4 ___3 ___2 ___1 Rarely

8. I felt competent

Almost Always ___7 ___6 ___5 ___4 ___3 ___2 ___1 Rarely

9. Someone or something else was in charge of my labour

Almost Always ___ ___ ___ ___ ___ ___ ___ Rarely
1 2 3 4 5 6 7

10. I felt inadequate

Almost Always ___ ___ ___ ___ ___ ___ ___ Rarely
1 2 3 4 5 6 7

11. I experienced a sense of distress

Almost Always ___ ___ ___ ___ ___ ___ ___ Rarely
1 2 3 4 5 6 7

12. Everything seemed unclear and unreal

Almost Always ___ ___ ___ ___ ___ ___ ___ Rarely
1 2 3 4 5 6 7

13. I was completely aware of everything that was happening

Almost Always ___ ___ ___ ___ ___ ___ ___ Rarely
7 6 5 4 3 2 1

14. I felt panicked

Almost Always ___ ___ ___ ___ ___ ___ ___ Rarely
1 2 3 4 5 6 7

15. I felt like I was falling to pieces

Almost Always ___ ___ ___ ___ ___ ___ ___ Rarely
1 2 3 4 5 6 7

16. I had a feeling of constriction and of being confined

Almost Always ___1 ___2 ___3 ___4 ___5 ___6 ___7 Rarely

17. I was in control

Almost Always ___7 ___6 ___5 ___4 ___3 ___2 ___1 Rarely

18. I experienced a sense of being with others who care

Almost Always ___7 ___6 ___5 ___4 ___3 ___2 ___1 Rarely

19. Everything made sense

Almost Always ___7 ___6 ___5 ___4 ___3 ___2 ___1 Rarely

20. I felt like I was dying

Almost Always ___1 ___2 ___3 ___4 ___5 ___6 ___7 Rarely

21. I felt I was doing everything I should have been doing

Almost Always ___7 ___6 ___5 ___4 ___3 ___2 ___1 Rarely

22. I felt helpless

Almost Always ___1 ___2 ___3 ___4 ___5 ___6 ___7 Rarely

23. Everything seemed peaceful and calm

Almost Always ___7 ___6 ___5 ___4 ___3 ___2 ___1 Rarely

24. I experienced a sense of success

Almost Always ___7 ___6 ___5 ___4 ___3 ___2 ___1 Rarely

25. I felt powerless

Almost Always ___1 ___2 ___3 ___4 ___5 ___6 ___7 Rarely

26. I experienced a sense of failure

Almost Always ___1 ___2 ___3 ___4 ___5 ___6 ___7 Rarely

27. I was accepting what was happening

Almost Always ___7 ___6 ___5 ___4 ___3 ___2 ___1 Rarely

28. I felt capable

Almost Always ___7 ___6 ___5 ___4 ___3 ___2 ___1 Rarely

29. I felt bad about my behaviour during labour

Almost Always ___1 ___2 ___3 ___4 ___5 ___6 ___7 Rarely

1. I was completely aware of everything that was happening

Almost Always ___7 ___6 ___5 ___4 ___3 ___2 ___1 Rarely

2. I felt tense

Almost Always ___1 ___2 ___3 ___4 ___5 ___6 ___7 Rarely

3. I felt confident

Almost Always ___7 ___6 ___5 ___4 ___3 ___2 ___1 Rarely

4. I had a feeling of control over what was happening to me

Almost Always ___7 ___6 ___5 ___4 ___3 ___2 ___1 Rarely

5. I felt fearful

Almost Always ___1 ___2 ___3 ___4 ___5 ___6 ___7 Rarely

6. I felt relaxed

Almost Always ___7 ___6 ___5 ___4 ___3 ___2 ___1 Rarely

7. I felt good about my behaviour

Almost Always ___7 ___6 ___5 ___4 ___3 ___2 ___1 Rarely

8. I felt helpless (powerless)

Almost Always ___1 ___2 ___3 ___4 ___5 ___6 ___7 Rarely

9. I felt I was with people who cared about me

Almost Always ___7 ___6 ___5 ___4 ___3 ___2 ___1 Rarely

10. I felt like a failure

Almost Always ___1 ___2 ___3 ___4 ___5 ___6 ___7 Rarely

Appendix H
Data Collection Form

Trial # _____. Date of randomization _____
Age:_____ years.
Gravida:_____ Para:_____ Gestational Age: _____ weeks

Short-Form McGill Pain Questionnaire (SF-MPQ)

Time: _____ . Cervical dilatation: _____ .
Sensory: _____ . Affective: _____
PPI: _____ VAS:_____ .

Short-Form McGill Pain Questionnaire (SF-MPQ)

Time:_____ . Cervical dilatation: _____ .
Sensory:_____ . Affective: _____ .
PPI: _____VAS: _____.

Short-Form McGill Pain Questionnaire (SF-MPQ)

Time:_____ . Cervical dilatation: _____ .
Sensory:_____ . Affective: _____ .
PPI: _____VAS: _____.

Short-Form McGill Pain Questionnaire (SF-MPQ)

Time:_____ . Cervical dilatation: _____ .
Sensory: _____ . Affective: _____ .
PPI: _____VAS: _____ .

Short-Form McGill Pain Questionnaire (SF-MPQ)

Time: _____. Cervical dilatation: _____ .
Sensory: _____. Affective: _____ .
PPI: _____VAS:_____ .

Record of Events (Check all that apply):

____ Oxytocin Augmentation	_____ AROM
____ Oxygen Administration (woman)	_____ Thick meconium
____ Systemic analgesia	_____ Caesarean Section
____ Regional analgesia	_____ Maternal temp. > 37.8 C
____ Forceps/vacuum extraction	_____ Intravenous infusion
____ Manual removal of placenta	_____ Third or fourth degree laceration
____ Fetal heart rate abnormalities	_____ 5-minute Apgar < 7
____ Evidence of maternal aspiration	_____ Other

Fluid Intake :	Frequency	Amount
Clear		
Milk-based		

Transferred out: ——— Yes——— No If transferred out, state reason: _____

_____

Length of labour (from Obstetrical Delivery Record): _____

.

First stage (hours & minutes):_____

Second stage (hours & minutes):_____

Labour Agentry Scale:_____

Interview questions:

1. What did you have to eat or drink before you came to the Hospital? When?

_____

_____

2. Did you follow the protocol you were assigned to for oral intake during labour?

—Yes — No

If not, why not? _____

3. Do you have any other comments you would like to make?_____

_____

Thank you for your participation.