University of Alberta

Bed Rest and Activity Restriction for Women at Risk for Preterm Birth – A Survey of Canadian Prenatal Care Providers

By

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Dedication

Dedicated to my parents Carol and David Sprague who instilled in me the values of hard work and dedication, and to my husband Tom Boudreau whose love and support guided me on this journey, and who truly believes that all dreams can be fulfilled.

Abstract

This study explored the practises of Canadian obstetricians, family physicians, and midwives in recommending bed rest or activity restriction for women at risk for preterm birth and examined whether they had decisional conflict about using this therapy.

A self-administered mail survey was sent to 1437 prenatal care providers. The questionnaire underwent expert review, content validity testing, revisions, translation into French and pre-testing. A proportionate stratified random sample of 30 percent was used for physicians. For midwives, a total population sample was taken in British Columbia, Alberta, Manitoba, and Quebec, and in Ontario a random sample of 30 percent was used. Using the Dillman protocol, each person in the sampling frame was contacted up to five times: pre-notice letter, first survey, reminder postcard, second survey, and third survey.

Of the 1437 potential participants, 813 (56.6%) returned surveys. Of these, 1168 were eligible for the study and 516 (44.2%) completed surveys. Thirty-five percent of obstetricians, 42.7 percent of family practitioners and 21.4 percent of midwives recommended bed rest in hospital. Larger numbers recommended bed rest at home: 64.7 percent of obstetricians, 69.9 percent of family practitioners and 52.1 percent of midwives. Two-thirds of care providers indicated that bed rest was only 'fair to poor' in helping to prevent preterm birth. Cervical changes as compared to other warning signs of preterm labour led to increased use of bed rest at all gestational ages in singletons and multiples. Sixty-one percent of obstetricians, 71.7 percent of family

physicians and 48.8 percent of midwives do ***NOT*** routinely recommend any sort of rehabilitative exercise program. The top five concerns about side effects associated with bed rest were deep vein thrombosis, stress, depression, sleep disturbances and economic problems. Care providers recommending bed rest have some decisional conflict as measured by the *Provider Decision Process Assessment Instrument* (mean score 30/60).

Except for situations of multiple pregnancy, there is inconsistent practice in recommending bed rest. There is also inconsistency about the extent of activity restriction to recommend. This data provides some of the first Canadian perspective on the use of bed rest in pregnancy and the decisional conflict of care providers in recommending this therapy, and offers valuable background information for future clinical trials.

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Chapter 1

BED REST AND ACTIVITY RESTRICTION FOR WOMEN AT RISK FOR PRETERM BIRTH – A SURVEY OF CANADIAN PRENATAL CARE PROVIDERS

Bed rest is a commonly prescribed clinical intervention for a variety of health problems. As anyone who has ever had the common cold will attest, the classic advice is to "get plenty of rest". Yet, the specific nature of rest or bed rest is not well defined. To some, it means going to bed and doing nothing other than getting up to the bathroom as needed. To others it means forgoing a day at work and resting at home. In the extreme, it means not even getting up to the bathroom so that the person undergoing bed rest becomes totally dependent on others to meet their daily nutrition, elimination, and social contact needs. Over the years as our understanding of the physiological processes associated with some illnesses has changed, so have the recommendations for rest or activity restriction. Due to side effects, the prescription for bed rest, especially prolonged bed rest is not as common as it once was.

In maternity care, activity restriction incorporating various levels of bed rest is still a mainstay of treatment for pregnancy-related problems such as threatened preterm birth, vaginal bleeding, multiple gestation, gestational hypertension and hyperemesis (Maloni, Cohen & Kane, 1998; Sprague, 2004). In the United States up to 20 percent of women are asked to rest in bed for at least a week and sometimes much longer during pregnancy (Goldenberg et al., 1994). Since no published Canadian data on the prevalence of bed rest during pregnancy was found, the number of Canadian women

who are asked to rest in bed or restrict their activity in some way during pregnancy is not known. With respect to preterm birth, approximately 7.6 percent of Canadian babies are born prior to term or 37 completed weeks of gestation (CPSS, 2003). If half of these women having a preterm birth were asked to rest in bed, there would have been about 12,570 women resting in bed either in hospital or at home during part of their pregnancy during 2003-2004 (StatsCan, 2005). Since preterm birth (PTB) is only one indication for bed rest, up to 66,160 Canadian women could potentially be asked to rest in bed each year for various reasons and various periods of time during their pregnancy if Canadian rates are comparable to those cited by Goldenberg and associates (1994) in the United States.

Complications associated with bed rest include problems with muscle strength and balance, bone de-mineralization, weight loss, electrolyte imbalances, and fluid compartment shifts that can persist into and beyond the postpartum period (Goldenberg et al., 1994; Maloni, 1998). Pregnant women on bed rest may be at higher risk for the life-threatening complication of thromboembolism (Kovacevich et al., 2000).

The quality of life for women who are prescribed bed rest, and for their families, is also affected as bed rest causes significant stress (including financial hardship) and alterations in mood states such as dysphoria (Gupton, Heaman &Ashcroft, 1997; Heaman & Gupton, 1998; Josten, Savik, Mullett, Campbell &Vincent, 1995; Maloni et al., 1998; Maloni, Kane, Suen &Wang, 2002; May, 2001; Schroeder, 1996). The associated hospitalization and/or antepartum home care, physical problems and emotional stress lead to increased health care costs. In other health care specialities, as

side effects and lack of efficacy of therapeutic bed rest or activity restriction have been demonstrated, the use of bed rest as a therapy has decreased (Allen, Glasziou & Del Mar, 1999).

To understand more about the frequency and circumstances under which family physicians, obstetricians and midwives recommend the use of bed rest for Canadian women at risk for preterm birth, a national survey of prenatal care providers was conducted. Preterm birth was chosen for investigation over other pregnancy complications because it is one of the most prevalent and significant problems encountered by providers of perinatal care (Moore & Freda, 1998). Despite the fact that newer screening modalities such as ultrasound measurement of cervical length and fetal fibronectin testing have improved the ability of care providers to determine who is at risk for preterm birth, it is still unclear what advice should be given to women after the diagnosis is made, particularly as it relates to their activity levels. There is very little evidence that can be used to assist health care providers in recommending one course of action over another.

A self-administered postal survey using Dillman's Tailored Design Method (2000) was used to address the following research question: Under what conditions do family physicians, obstetricians and midwives recommend therapeutic bed rest or some level of activity restriction when a woman is at risk for preterm birth? More specific questions were:

- What do obstetricians, family physicians* and midwives believe about the efficacy of bed rest and activity restriction for women at risk of preterm birth?

- What are the usual practices of obstetricians, family physicians and midwives in recommending bed rest for women at risk of preterm birth?
- What concerns do obstetricians, family physicians and midwives have about the side effects associated with bed rest?
- What are the perceptions of obstetricians, family physicians and midwives about women's compliance with their recommendations for therapeutic bed rest?
- Do obstetricians, family physicians and midwives have any degree of decisional conflict when recommending bed rest for women at risk of preterm birth?

**NB: For the purpose of this thesis, the term 'family physician' will be understood to also include general practitioners*

The theoretical perspective for this study was that uncertainty and lack of evidence about the efficacy of therapeutic recommendations could lead to some degree of decisional conflict in health care providers as it relates to the use of bed rest. Decisional conflict occurs when patients or health care providers are uncertain about which course of action to take (O'Connor, Jacobsen & Stacey, 2002). Decisional conflict in physicians and midwives, as it relates to the use of prescribed bed rest for women at risk for preterm birth, was evaluated by inclusion of a validated scale, the *Provider Decision Process Assessment Instrument* (Dolan, 1999) within the survey.

Knowing more about perinatal care providers' recommendations for bed rest or activity restriction as a therapeutic intervention for women at risk for preterm birth is important because: a) there are no clinical practice guidelines or best practice

summaries to guide care providers despite preterm birth being one of the most pressing problems in perinatal care; b) the efficacy of activity restriction in prolonging gestation is unknown; c) there are known physiological and psychosocial side effects associated with this therapy; d) there are tremendous health care costs and quality of life issues for women on bed rest and their families; and, e) the prevalence of activity restriction is potentially quite high as the preterm birth rate in Canada is about 7.6 percent (i.e., about 25,000 babies per year). The findings from this research study provide important background data needed to plan further studies on the efficacy of activity restriction for women at risk of delivering preterm.

Until further studies can be conducted to assess whether activity restriction is efficacious for women at risk of preterm birth, data from this survey will provide information about the patterns of use of bed rest or other types of activity restriction as a therapy and the degree of conflict that care providers have in recommending this therapy. In addition, data will provide insights about how providers of maternity care make decisions around prescribing therapeutic bed rest.

Chapter 2

BED REST IN PREGNANCY

In this chapter, the research on bed rest during pregnancy and for other health issues is explored. The historical aspects are outlined and then an overview of what is known about the physical and psychosocial side effects and efficacy of therapeutic bed rest and/or activity restriction is presented.

The Evolution of Bed Rest as a Therapeutic Intervention

Rest as a treatment for illness can be traced back to antiquity. Hippocrates, a legendary physician of the fifth century B.C. wrote extensively on medicine, health and illness. Chadwick and Mann (1950) translated his views on the subject of rest: "Rest as soon as there is pain is a great restorative in all disturbances of the body" (p. 154). Hippocrates cautioned that, "if the whole body is rested much more than is usual, there is no immediate increase in strength. In fact, should a long period of inactivity be followed by a sudden return to exercise, there will be an obvious deterioration" (p. 140). He concluded by saying that any change in excess of what is moderate, is harmful.

How did bed rest become a cornerstone of therapeutic intervention and find its way into modern clinical practice? Bed rest as a therapy was rare before the nineteenth century (Sandler & Vernikos, 1986). Sick people rarely went to bed because they were afraid of losing income necessary for family survival. There was also a sense that if one

went to bed, one might not get up again. This is supported by Browse (1965), who states that it was considered a sin to "die with your boots off".

In the 1860s the notion of putting people to bed to improve their health and ability to heal surfaced when Dr. John Hilton published a book on bed rest as a therapeutic measure. His thesis was that if rest helped to heal broken bones, it could also help heal other systems in the body. Browse (1965) stated that, while Hilton's thesis was correct, the vast majority of practitioners misunderstood the context of the recommendation. Somehow it was interpreted that most patients should be put to bed, in many cases for an indeterminate length of time. "The misinterpretation of Hilton's words raised the bed to the pinnacle of medical therapeutic aids. The bed that once was a place for sleeping could now cure every ill. It could do no wrong and without it the physician and surgeon was powerless" (Browse, 1965, p.3). As a result of this new form of treatment, the work of nursing was partially defined by the need to minimize the complications of therapeutic bed rest. As nurses were responsible for caring for patients who were for the most part immobile, and there was little in the way of curative measures in the mid nineteenth century, much of nursing work involved the prevention of complications associated with immobility, including principles of asepsis, basic hygienic principles and prevention of bedsores (McPherson, 1996).

The practice of bed rest continued as a foundation of medical and nursing practice well into the 1950s (Sprague, 2004). Patients with myocardial infarction, congestive heart failure, pulmonary tuberculosis, peptic ulceration, rheumatic fever, psychiatric illnesses and other problems were prescribed this intervention, with the

thought that bed rest helped to reduce fatigue and the functional demands on the body (Maloni, 1998). Harmer's well known series of books on the *Principles and Practices of Nursing* included a chapter on the maintenance of health by exercise, rest, and sleep (Harmer, 1929). Harmer stated, "... in the nursing care of sick people one of the most influential factors and one of the first and most responsible duties of a nurse is to see that her patients have sufficient physical and mental rest and sleep. Sleep is often of much greater importance than all other measures devoted to the treatment of disease itself" (p. 109).

Harmer (1929) recognized some of the problems that inactivity caused for the body. "Sick people usually suffer sadly from the lack of exercise...the object is to regulate the expenditure of energy" (p. 109). Harmer felt it was the nurse's role to know and practice the proper use of exercise and rest in the daily care of patients. She did, however, caution nurses to beware of patient's wishes or feelings about their activity. For patients who wished to help with their bath or to move about in their beds, she advised her readers that, "in certain cases to promote such activity would be harmful and perhaps even fatal" (p. 109).

By the 1940s there was a shift in thinking about the utility of bed rest for some conditions. Major reasons for the change have been postulated (Maloni, 1998). First, there were observational data about the treatment of soldiers who were wounded in World War II. Soldiers who returned to battle sooner because of their unit's need for more men seemed to recover better from their injuries. Second was the growth of knowledge in the aerospace industry. Since the 1950s, bed rest has been used as a

proxy for weightlessness in the study of perceived effects of weightlessness that would occur in space. Scientists began to identify adverse effects associated with bed rest. As the results of these experiments were published, physicians began to slowly change their practice, allowing patients to ambulate sooner after surgery, and discouraging the elderly from staying in bed too long (Bergel, 1990).

However, as with any other major shift in clinical practice, it took many years for it to become a standard of care. The *Clinical Instruction Binder* of the Ottawa Civic Hospital (Anonymous, 1956-1957) had a section titled "Routine Specialized Care of the Cardiac Patient". In regards to rest, the recommendation was to, "give as much rest as possible ... limit physical activity". According to the ambulation protocol, the progression to full activity could take weeks, depending on the physician's orders. Similar protocols were found for other illnesses.

The Physiological Effects of Bed Rest

The physiological effects of bed rest have been reviewed (Browse, 1965; Convertino, Bloomfield & Greenleaf, 1997; Fortney, Schneider & Greenleaf, 1996; Sandler & Vernikos, 1986), and there is consensus that virtually every system is in some way affected. In general, confinement to bed causes impairment of cardiovascular, hematologic, musculoskeletal, metabolic, thermoregulatory, immune, neuroendocrine and psychological functions. The extent of the changes that occur in individuals on bed rest and their ability to recover from these effects depend on the age and general health of the individual, as well as on the amount of time spent in bed, the

degree of movement while in bed, and whether any exercise was done in bed to try and ameliorate the effects of bed rest (Kasper, Talbot & Gaines, 2002).

Much of the research on bed rest has been done to determine the physiological and psychological effects of bed rest on individuals prior to exposing them to extended periods of weightlessness in space. This research related to bed rest is challenging to interpret and frequently cannot be generalized to a population of pregnant women because the studies often involved small numbers of subjects in varying degrees of cardiovascular fitness who were prescribed different amounts of bed rest in different degrees of head down tilt. In addition, studies were predominantly done using male subjects.

Bed rest profoundly affects the musculoskeletal system. Bloomfield (1997) reported that changes in bone and muscle tissue start within days of beginning bed rest. The absence of weight bearing changes the size and shape of the long bones, spine, and skeletal muscles supporting these structures (Sandler & Vernikos, 1986). Large amounts of calcium start to be excreted in urine and feces within days of beginning bed rest and this continues over time (Bloomfield, 1997). Because of calcium loss, there is a progressive decrease in bone mass (National Institutes of Health, 2005). Bloomfield (1997) reported that increasing calcium intake to over 1000 milligrams per day could reduce some of the loss, but will not normalize the negative calcium balance or prevent changes in bone density. She cautioned that while the changes in bone mass are not likely to have any immediate impact on functional capacity, like that which occurs with

muscle atrophy, the theoretical concern is that over time a decrease in bone mass may lead to osteoporosis and later risks of fracture if prevention methods are not used.

Muscle tissue atrophy is another common side effect of inactivity. This is easily seen in individuals who have had a body part immobilized due to casting of a broken bone. In the case of bed rest, one of the first signs of muscle breakdown is the urinary excretion of nitrogen that starts about four or five days after immobilization. A negative nitrogen balance is an early marker of muscle atrophy (Bloomfield, 1997). Different body muscles are affected and the degree of atrophy will depend on the degree to which mobility is impaired (Kasper et al., 2002). For example, if the arms were used to help change positions while in bed, the degree of atrophy in these muscles would not be as great as if the person was completely immobile. In a group of sedentary students, a loss of muscle mass for knee flexion and extension as well as total leg strength was noted after 10 days of bed rest and statistically significant changes were seen after 20 days (Suzuki et al., 1994). Ellis and colleagues (1993) demonstrated changes in muscle thickness in a group of men who rested in bed for 30 days. Losses of strength and muscle mass in the lower body are greater than those in the upper body. Leg extensors are affected to a greater degree than leg flexors (Bloomfield, 1997). While earlier researchers were unsure how long muscle strength took to recover (Sandler & Vernikos, 1986), Bloomfield (1997) reported that within 30 days of the end of bed rest, strength in knee flexors and extensors recover to 92 percent of pre bed rest levels. However, it is not only loss of muscle strength that is of concern to those recovering from bed rest. Changes in balance and walking ability will occur. Browse (1965) cautioned that

severe muscle weakness can cause extra stress on joints and ligaments and may lead to backache, neck problems, and instability in movement due to strain on ankle and knee joints. In addition, recovery from muscle atrophy can cause further injury as atrophy causes an altered ability of muscle fibres to bear the stress of external loads (Kasper et al., 2002).

Researchers have attempted to decrease some of the musculo-skeletal impairment associated with bed rest by evaluating exercise programs as part of the daily routine of study participants on bed rest. While some of the changes seem reversible with re-conditioning and time (Akima et al., 2005), the long-term effects of inactivity are not known. Some muscle thickness in the rectus femoris and vastus intermedius anterior thigh muscles can be maintained by isotonic cycle ergometer exercise or intensive intermittent isokinetic exercise (Ellis et al., 1993). Problems in the posterior leg muscles during 30 days of 6 degrees head-down bed rest could not, however, be prevented. These exercise routines described by Ellis improved muscle mass, strength and endurance. These routines also helped to maintain plasma and red cell volumes and improved the body's water balance in subjects who were on bed rest for 30 days in a head-down tilt position (Greenleaf, 1997). In men who were on bed rest for 20 days in 6 degrees of head down tilt position, isometric leg-press training prevented deconditioning of their knee extensor muscle group (Akima et al., 2000). While it is suggested that improvement can be made in some muscle groups, there is still uncertainty about the long-term effects of bed rest on muscles and other body systems.

Although it is understandable that muscles and bones might be affected by relative immobility, practitioners need to be aware that other systems in the body also undergo changes during bed rest and activity restriction. The ability of the circulatory system to adapt to upright posture after a prolonged period of lying down is diminished. Re-establishing blood flow patterns sufficient to perfuse the upper body and brain when standing, takes time. Sandler and Vernikos (1986) reported that by 3 to 4 weeks of bed rest, the orthostatic response is diminished and the time needed for recovery increases. This phenomenon may occur much earlier. Siguado's group (1996) demonstrated that in eight male subjects placed in 6 degrees of head down tilt, cardiovascular deconditioning started to occur after day 4. When standing erect, arterioles of the muscles and splanchnic circulation are constricted so as to ensure adequate circulating blood volume. During bed rest, the vessels dilate. Over a long period of time, bed rest seems to cause these vessels to lose their ability to constrict (Browse, 1965). Normally, when a person stands after a period of lying down, there is a decrease in central venous pressure, changes in cardiac and vascular wall stress, and decreases in systemic blood pressure, which activate baroreceptor reflexes and the renin-angiotensin-aldosterone and vasopressin systems to normalize blood pressure (Lathers & Charles, 1993). When a person stands after being on bed rest for a few weeks, and the orthostatic response is diminished, blood rushes into these still-open vessels and circulating blood volume falls, blood pressure falls and the individual feels faint. Lathers and Charles (1993) described different types of fluid therapy, positional changes and medications that are used to correct orthostatic hypotension. Because the cardiovascular effects of bed rest

are quite dramatic, aerospace scientists coined the term *cardiovascular deconditioning* to describe bouts of orthostatic intolerance, fainting, increased heart rate, syncope and fatigue experienced after bed rest (Maloni, 1998). Waters' group (2005) explored using rehydration and salt tablets prior to ending bed rest to restore fluid volume and reduce hemodynamic and endocrine changes and orthostatic hypotension.

The positional change from standing or sitting to lying down also leads to fluid shifts, electrolyte changes and kidney redistribution. When lying down, the fluid that normally was in the lower part of the body settles in the upper part of the body, mostly in the heart and lungs (Fortney et al., 1996). The excess fluid stimulates cardio-pulmonary and arterial baroreceptors to inhibit the renin-angiotensin-aldosterone system and the secretion of antidiuretic hormone, thus leading to diuresis, and over time, to hypovolemia (Maloni, 1998). Fluids and electrolyte balance is also altered and potassium balance changes as muscle wasting occurs. An increased urinary loss of potassium, that occurs almost immediately, peaks at about the first week of bed rest and continues thereafter (Fortney et al., 1996). Sodium concentration also changes for the first few days of bed rest. All of these changes are exacerbated further when the bed rest involves head down tilt (Fortney et al., 1996).

Changes in red cell volume accompany fluid shifts although the mechanisms for this are not well understood (Fortney et al., 1996). During the first month of bed rest, change in red cell mass may be due to inhibition of production. As hemoconcentration occurs due to fluid loss, erythropoietin (a precursor for red cell production) decreases, and red blood cell production decreases. Other changes in erythropoietin levels may be

due to bone demineralization and negative calcium balance. Further red cell loss may be due to decreased oxygen demand because of a reduced metabolic rate (Fortney et al., 1996).

Metabolic and endocrine functions also change with bed rest. Those on bed rest will have a lower basal metabolic rate and weight loss. The weight loss is probably a combination of fluid loss, muscle loss and decreased appetite (Maloni, 1998). There have been varying reports of the effect of bed rest on immune system function. Tkaczuk and colleagues (2000) found no change in immune system function following 42 days of bed rest with a 6-degree head-down tilt. In studies conducted in the 1970s it was hypothesized that there was a decrease in the function of T-lymphocytes (Maloni, 1998). Fortney and colleagues (1996) concluded that bed rest of less than 8 days could result in unchanged or depressed immune function. In longer periods of bed rest, the same authors recommend further research. Other problems associated with bed rest include changes in glucose metabolism, even under the strictest dietary control; changes in sleep patterns and circadian rhythms; and changes in hormonal secretion (Maloni, 1998).

The Psychological Effects of Bed Rest

Psychological effects of bed rest have also been investigated. In many of the studies, participants were positioned in a head-down tilt. Ishizaki's team (1997) measured changes in the psychological states of a small group of males and females on bed rest for 20 days. They found a tendency towards depression and neurosis. They

also found a significant increase in urinary excretion of a hormone released during periods of stress (i.e., 17-hydroxycorticosteroid). They were unable to determine if the increased stress was due to immobilization or to the individual's personal problems. The same group reported that the tendency toward depression and neuroses disappeared after two months of bed rest (Ishizaki et al., 1994), which is consistent with a review by Fortney, Schneider and Greenleaf (1996).

Performance and mood impairment was studied in 18 men kept in 6-degree head-down tilt for 30 days, some who had a formal exercise program and some who did not (DeRoshai & Greenleaf, 1993). In contrast to other researchers, they found very few changes in performance and mood in either group and concluded that prolonged bed rest did not seem to affect either performance or mood states. Maloni (1998) summarized some of the potential problems encountered by individuals during bed rest. There is sensory deprivation, lack of social interaction, and some degree of social isolation. This may be acutely stressful for some individuals, which then can compound some of the physical problems already described.

Bed Rest in Pregnancy

Can evidence of physiological and psychological side effects associated with bed rest in non-pregnant individuals be generalized to women who are asked to rest in bed because of a pregnancy complication? Before answering that question, let us explore the history of bed rest as an intervention in pregnancy.

While bed rest during the antepartum period became more common in the 1900s, after the introduction of formal antenatal care, the use of bed rest in the

postpartum period has been practised by cultures throughout the world, including those in North America, since settlement by the English (Wertz & Wertz, 1977). Several weeks of "lying-in" were the norm for Victorian women following the birth of a baby. The length of the lying-in period differed depending on the practitioner. In the 1908 edition of De Lee's textbook *Obstetrics for Nurses*, recommendations for bed rest following childbirth were outlined.

> "While most accoucheurs allow the woman to get out of bed on the tenth day, others allow this only in the third or fourth week. A very few physicians allow the women to get up when they feel able for it, even if it is the second day. The attending physician will specify what the nurse should do in these cases. The writer's practice is to allow the woman to sit up in bed on the ninth day, to get out into a rocker or Morris chair on the tenth, stand on her feet on the eleventh, have the freedom of the room on the twelfth, and go down-stairs on the fifteenth day" (p. 147).

The practice of lying-in underwent changes throughout the 1900's. By the 1940's women were starting to question why birth was treated as a pathological event and why they could not take more responsibility for self-care (Wertz & Wertz, 1977). This shift in thinking by women was probably the impetus for what we now know as the start of women- and family-centred care.

Balance between rest and activity has always been seen as necessary in a normal healthy pregnancy. As far back as the late 1600's in a textbook on midwifery, Barret reported a plan to be followed upon confirmation of a pregnancy (Eccles, 1982). The regimen was based on the right use of the classical six 'non-naturals', which are air, food and drink, exercise and rest, sleep and waking, fullness and emptiness, and passions of the mind. Barret claimed that the right ordering of these things would keep

the pregnant woman in good form (Eccles, 1982). This has not really changed over time. Pregnant women are counselled to rest, eat well, and engage in activities in moderation, including exercising to their comfort level.

However, when pregnancy became problematic and the best course of action was not known, bed rest was prescribed. A midwifery book from the mid 1800s included a discussion on the use of bed rest for pregnancy problems (Churchill, 1858):

> If the patient has previously miscarried, as she approaches again the same period, she must take more rest, lying on a sofa or bed, lightly covered, the greater part of the day, until the period be passed. Rest, more or less absolute, is one of the most powerful prophylactic means we possess (p. 187).

It has long been recommended in *William's Obstetrics*, the classic textbook for obstetric care providers, as well as in many other textbooks, that women rest in bed if they have various pregnancy complications. More specifically, the complications of preterm labour and gestational hypertension (formally known as toxemia of pregnancy or preeclampsia) have been singled out as phenomena where those experiencing it would benefit from bed rest (Goldenberg et al., 1994). Over the years bed rest has also been prescribed in a prophylactic manner for women experiencing spotting, multiple gestation, intrauterine growth restriction, placenta previa, or hyperemesis. As well, any women at high risk of preterm birth due to another type of complication, such as having a previous preterm birth, were also prescribed bed rest. Similar to the phenomenon described earlier in this chapter, the practice of bed rest as a therapy for these complications seemed to be universally accepted and became a routine practice

although evidence of its effectiveness cannot be found (Maloni, 1998). In some cases it was the only treatment option available to the care provider.

What is the extent to which bed rest continues to be prescribed in current times? In a United States study, more than 90 percent of obstetricians recommended bed rest to avoid miscarriage, preterm labour and other pregnancy complications (Maloni et al., 1998). About 18 percent of all women who deliver after 20 weeks gestation in the United States each year are asked to rest in bed for at least a week, and some for much longer (Goldenberg et al., 1994). Goldenberg describes bed rest as one of the most commonly prescribed treatments to improve reproductive outcome. Yet, there is very limited evidence of the effectiveness of this intervention, and questions have been raised about possible harm.

Although there have been physiological studies carried out to evaluate the effects of bed rest in non-pregnant populations, limited research was found on how bed rest influences the physiology of pregnant women. Studies completed were often not well controlled for the type and amount of bed rest prescribed (Maloni & Kasper, 1993). Generalizing the results of research on the effects and efficacy of bed rest from those who are not pregnant to those who are is problematic. Participants in most of the studies were males who were subjected to bed rest because this therapy was considered a proxy for studying the effects of weightlessness. In addition participants in many of the studies were required to rest in a position where their heads were tilted down by 6 degrees. This is not comparable to the position of the majority of pregnant women on bed rest. So, while there are some similarities in findings, influences of gender

differences, positional differences and the physiology of pregnancy cannot be discounted.

In Table 1 theoretical areas of physiological concern about the use of bed rest in pregnancy are outlined. Some of these areas have been explored further in pregnant women. Although most women who are asked to rest in bed during pregnancy are able to get up to the bathroom, occasionally women with early gestational age and cervical dilatation with protruding membranes are kept in a head-down tilt position, exacerbating the concerns listed below (Fortney et al., 1996).

Table 1 – Concerns About the Use of Bed Rest in Pregnancy

Theoretical Risk	Concerns
Muscle weakness Orthostatic hypertension Cardiovascular deconditioning	Most women are actively caring for a newborn immediately after the birth process
Decreased bone density	Women already at risk for osteoporosis
Weight loss	Weight gain is required to meet the metabolic demands of the pregnancy and the fetus. Weight loss through appetite suppression is a particular concern.
Fatigue	Risk factor for postpartum depression
Fluid volume deficits and endocrine imbalances	Normal fluid volume and hormone balance critical to breastfeeding
Decreased red cell mass	Red blood cells needed for oxygenation

Promislow and colleagues (2004) showed a loss of trabecular bone during pregnancy, particularly in women prescribed bed rest. In their cohort of women on bed

rest, not only was trabecular bone loss greater, but also there was substantially increased odds of losing 5 or greater percent of ultra-distal bone mineral density in the 20-week study period (16 to 36 weeks gestation). Unfortunately, no correlation with bone loss at the hip and spine was studied and the reversibility of this bone loss in the postpartum period was not assessed. The authors recommended further study.

Maloni and colleagues (1993) demonstrated that, similar to non-pregnant individuals, pregnant women on bed rest had gastrocnemius muscle dysfunction that makes weight bearing difficult in the postpartum period. Their postpartum recovery was prolonged and they suffered from muscular and cardiovascular deconditioning. The effects were dose dependent in that the longer and more pronounced the period of rest, the greater was the likelihood of complications. The time required for gastrocnemius muscle re-oxygenation after muscle exercise significantly increased across antepartum bed rest and significantly decreased across the postpartum period as the activity of the women increased (Maloni & Schneider, 2002). Women reported postpartum muscle soreness, deconditioning, and mobility problems. The authors recommended formal rehabilitation programs for women who have been on bed rest.

Maloni and colleagues (2004a) also looked at maternal weight changes associated with antepartum bed rest. They found that antepartum weight gain in pregnant women on bed rest was significantly lower than national recommendations. Additionally, they found that infant birth weights were lower than norms established for gestational age, race and gender.

Studies incorporating bed rest as part of the treatment regimen have been conducted for women diagnosed with preeclampsia, fetal growth restriction, multiple pregnancy, bleeding, cervical incompetence, preterm labour, and venous thromboembolism. In most cases, the outcome measures were related to fetal/newborn health rather than maternal side effects. When a pregnancy is deemed to be 'high risk', the risk is generally thought to exist for the fetus rather than the mother. Since relatively little harm is thought to occur to the fetus during periods of bed rest, the practice continues (Schroeder, 1998).

In a randomized controlled trial (n=95), active management (induction of labour or cesarean section after administration of corticosteroids for fetal lung maturity) versus expectant management (bed rest, intense fetal surveillance and pharmacologic management of blood pressure) was compared for women with severe preeclampsia at 28 to 32 weeks gestation. Expectant management reduced neonatal complications and neonatal stay in the NICU (Sibai, Mercer, Schiff & Friedman, 1994). This is not surprising because at this gestational age, any delay in delivery is likely to improve neonatal outcome. In another randomized trial (n=218), it was reported that hospital admission for bed rest decreased the risk of developing severe hypertension but did not improve fetal growth or neonatal morbidity (Crowther, Bouwmeester & Ashurst, 1992).

In the United Kingdom, mixed results were reported on the efficacy of bed rest for proteinuric hypertension during pregnancy. In a randomized trial (n=40), strict bed rest for women at very high risk was associated with a better prognosis for the fetus, but it was postulated that it might have been because these women developed warning signs

of eclampsia and were delivered early, thereby improving the outcome for the fetus (Mathews, Agarwal & Shuttleworth, 1982). In another randomized trial of women with non-proteinuric hypertension (n=135), Mathews found no benefit from bed rest as a therapy (1977). In an overview of the evidence of bed rest as a therapy for both proteinuric and non-proteinuric hypertension, Goldenberg et al. (1994) concluded that bed rest for women having gestational hypertension remains controversial. Because of this, they recommended close clinical observation for women with this condition, but stopped short of recommending bed rest. Meher, Abalos and Carroli (2005) reported in a Cochrane review that there is insufficient evidence to provide clear guidance for clinical practice. They suggested that bed rest should not be recommended routinely for hypertension in pregnancy, especially since more women appear to prefer unrestricted activity if given a choice.

Little information was found about the impact of therapeutic bed rest on fetal growth. Say, Gulmezoglu & Hofmeyr (2005) found no evidence was in well-controlled studies that bed rest in hospital promotes fetal growth. However, the samples sizes in the studies were small so the possibility of benefit cannot be excluded until further research is done. These investigators concluded that there is not enough evidence to evaluate the use of a bed rest and establish hospital policy for women with suspected impaired fetal growth.

The use of bed rest for women experiencing multiple gestation has been evaluated. At one time it was almost routine for these women to be put on bed rest, either at home or in hospital, by about 24 to 28 weeks gestation. One theory was that

rest would help to reduce the pressure on the cervix from the added weight in the uterus, thereby decreasing the chance of preterm labour and birth. As with many other practices, hospitalizing women with multiple gestation to monitor bed rest became an almost routine clinical practice although there was no evidence of its effectiveness. When this hypothesis was tested in randomized controlled trials, it was not supported. In a Cochrane review, Crowther (2001) asserted there is currently not enough evidence to support a policy of routine hospitalization for bed rest in those experiencing a multiple pregnancy. There is no reduction in the risk of preterm birth or perinatal death, though fetal growth may be improved. For women with uncomplicated twin pregnancies, it may actually be the cause of more preterm birth and thus is considered harmful. Crowther (2001) concluded that a policy of bed rest for women with multiple gestation cannot be recommended for routine clinical practice.

Because pregnancy is already a hypercoaguable state and bed rest leads to circulatory stasis, pregnant women could be at risk for the serious complication of venous thromboembolism. Carr's group (1997) assessed the risk of thromboembolism in women on bed rest to be less than one percent. Danilenko-Dixon and associates (2001) found no association between bed rest and thromboembolism in pregnant women. Kovacevich's group (2000), however, found that pregnant women on bed rest had a significantly higher risk. In this retrospective review of women prescribed three or more days of bed rest for preterm labour or preterm premature rupture of the membranes, the prevalence of thromboembolism was 15.6 cases/1000 as compared to 0.8 cases/1000 in the women not exposed to bed rest ($p<.0015$).

Bed rest has been a key therapeutic strategy in the treatment of preterm labour. The desired result was that preterm birth would be deterred. Since the causes of preterm labour are multifactorial and no single etiology has been identified, there is little evidence available to guide practitioners when treating women with premature cervical changes. Armson and colleagues (2003), in a case control study, did find that activity restriction and uterine activity monitoring by self-palpation might reduce the likelihood of preterm birth in women with no identifiable risk factors for preterm birth. In a review of the one trial of bed rest compared to placebo, Sosa and colleagues (2003) discouraged physicians from routinely recommending bed rest due to the potential adverse effects on women and their families. Part of the difficulty in researching the effects of bed rest is that it is difficult to pinpoint the influence of bed rest on outcomes for preterm labour because it has usually been combined with other interventions such as treatment with labour-halting medications (tocolytics) and corticosteroids to enhance fetal lung maturity. An example of this issue is in the treatment of cervical incompetence. Treatment usually consists of bed rest and/or cervical cerclage. In a randomized controlled trial, women with a short cervix (<25 mm) or signs of symptoms of cervical incompetence before 27 weeks gestation were admitted to hospital and randomly assigned for emergency cerclage and tocolysis with indomethacin or bed rest. All women received antibiotics. Women who had the cerclage and tocolysis delivered significantly later than women on bed rest (mean of 29.9 weeks versus 25.9 weeks (Althuisius, Dekker, Hummel, Bekedam & van Geijn, 2002). The focus of this study

was to evaluate the efficacy of cerclage as opposed to discussing the apparent ineffectiveness of bed rest in helping to halt preterm birth.

Ultrasound measurement of cervical length, which is becoming more common, can be used to identify with much more accuracy women whose cervical length is shortening (Berghella & Berghella, 2005; Bernhardt & Dorman, 2004; Iams, 2003; Van den Hof & Crane, 2001; Williams & Iams, 2004). Another test designed to improve the diagnostic accuracy of potential preterm birth is fetal fibronectin testing. Fetal fibronectin (FFN) is a glycoprotein found in the amniotic membranes, decidua and cytotrophoblast. When FFN is present in the lower reproductive tract, it is believed that there has been disruption of membrane integrity at a cellular level. The presence of FFN is associated with an increased risk of impending labour and subsequent birth, at any gestational age. A positive FFN was highly associated with preterm delivery within 7 days, 14 days and at less than 37 weeks (Iams et al., 1995; Peaceman et al., 1997). FFN testing is probably most useful for its negative predictive value. Women with a negative test had a less than a one percent risk of delivery within a week. In a meta-analysis of the trials conducted to-date (Leitich & Kaider, 2003), the authors concluded that FFN testing is an effective short-term marker of preterm delivery, especially in women with symptoms of preterm labour.

Psychosocial Implications of Bed Rest

The psychosocial effects of bed rest are just as important as the physiological changes that occur when women are put on bed rest during pregnancy. At the

beginning of the 20th century, De Lee (1908) wrote on the maternal mind during pregnancy.

> "The pregnant woman should lead a placid, quiet life, avoiding mental as well as physical fatigue and excitement. The patient should read good books and avoid medical subjects. It is not necessary for her to be acquainted with the processes of labor and its various complications ... The patient must not be allowed to worry over her condition and her approaching labor. So far as possible she should be removed from association with gossiping neighbors, who take pleasure in recounting the difficulties and dangers of parturition" (p. 81).

Today, most women would find this statement paternalistic and quite unacceptable. At the time, though, it was De Lee's answer to reducing anxiety during pregnancy, a concept he felt was important for good outcomes. He did not write on the state of the mind during a more problematic pregnancy, but more recent investigators have explored the psychological effects of complications during pregnancy and bed rest. Women on bed rest during pregnancy have increased stress, mood alterations, anxiety, sleep disturbances, depression, feelings of loss of control (Maloni, 1998) and dysphoria (defined as a composite of symptoms of negative affect) (Maloni et al., 2002). For women who were prescribed bed rest, levels of dysphoria were highest on admission to hospital and decreased over time. Dysphoria in the postpartum period was related to the infant's state of health at birth.

In a qualitative study of women's perceptions of bed rest, Heaman and Gupton (1998) interviewed 24 women who were on partial or complete bed rest for at least 7 days. Half of the women were at home and half were in hospital. They found that bed rest had a significant emotional and social impact on pregnant women, and women in

hospital had more sources of stress than women at home. Stressors in the hospitalized group included being away from family, lack of privacy, problems with roommates and hospital discomforts. While women generally felt better about being at home, they experienced stress because they usually needed to do more than was "permitted" just because they were home and could see that their children or partner needed help. Women in both settings experienced feelings of boredom, loneliness and depression. The same data were used to propose a model of the stress process experienced by pregnant women assigned to bed rest. The authors looked at the stressors, manifestations of stress and mediators of stress (Gupton et al., 1997). Stressors were defined as situational, environmental and familial. Manifestations of stress were divided into emotional, social and physical dimensions. Mediators of stress were social support and coping. The authors called for this model to be tested among diverse populations to determine if the model provides a clear depiction of women's specific experiences with bed rest.

Schroeder (1996) interviewed 12 women who were prescribed bed rest for a minimum of 20 hours per day for at least 3 weeks duration. The women described a high level of physical, emotional, familial and economic hardship associated with the bed rest experience. Women felt a profound lack of control over their bodies and pregnancies. An interesting theme through this study was the feeling by the women that their health care providers had no concept of what bed rest did to their lives or those of their families. In fact, compliance with prescribed bed rest was often a problem when women had limited family or economic support and when childcare was a problem

(Josten et al., 1995). In this retrospective study, pregnancy outcome did not differ between women who complied with the prescription for bed rest and those who did not. However, the authors cautioned that more prospective work is required to confirm these findings (Josten et al., 1995).

Some women experience emotional distress and family disruption as a result of bed rest (May, 2001). In a qualitative study, May (2001) found that a number of women "tested the limits" by engaging in more activity than was recommended, often because they needed to meet the needs of other family members or to provide childcare. There were two distinct groups among participants in this study; those women who felt they were "doing okay" versus those that were "on the edge". May found a number of predisposing conditions that appeared to enhance or limit the extent to which women and their partners could manage the demands of bed rest. She labelled them as: experience as an individual or couple in meeting life challenges; readiness for or acceptance of the pregnancy; perceived adequacy of a "safety net"; and, realistic confidence in treatment. Durham (1999), using a grounded theory methodology found that women on bed rest for preterm labour went through three stages. They were the diagnostic phase, the negotiation phase, and the preparation phase. Although women in the diagnostic phase maintained bed rest, they eventually passed into the negotiation phase where they bargained with themselves about what they would and would not do to meet the needs of their families, despite being prescribed bed rest. A major finding of this study was that, although women understood the need for bed rest, they usually

modified their activity levels because the needs of their families could not be met while on bed rest.

Paternal feelings of stress associated with the diagnosis of a pregnancy problem, assuming multiple roles, and managing the day-to-day needs of the family have also been explored (Maloni & Ponder, 1997; May, 1994). It was recommended that health care providers consider the needs of the partner of a woman who is prescribed bed rest. The providers should assess stress levels and find ways to help decrease stress for the couple.

Economic considerations are another source of stress associated with prescribed bed rest for women and their families. Women who work outside the home often lose income while away from work with a pregnancy complication. Childcare can be an added expense for some families if the mother is normally responsible for this and is not able to take part because of the need for bed rest. Economic problems are contributors to poor compliance to prescribed bed rest (Josten et al., 1995).

Effects on the Newborn

Bellieni and colleagues (2003), using a case control design, studied infant behaviour with mothers who had at least 15 consecutive days of bed rest. They found that, compared to the control group, infants of the bed rest group had more allergies, motion sickness, and the need to be rocked to fall asleep. While the authors acknowledged that further studies are required to confirm these findings, this is one of the first studies to look at the effects of bed rest on the newborn. In a follow-up retrospective study, a

possible association between maternal bed rest and infant colic was identified (Bellieni et al., 2005).

Summary of the Literature Review

To summarize what is known about the physiological and psychosocial effects of bed rest, it is reasonable to conclude that there are physiological effects on bone, muscle strength, cardiovascular conditioning, weight, and electrolyte balance. There are equally important psychological effects, including increased anxiety/stress and impaired coping within many families. It is not known if there is a critical threshold at which the physiological effects of bed rest are reversible or whether an exercise program while in bed mediates any of the physiological or psychosocial effects. There is limited knowledge about the long-term deficits following a period of bed rest. There is also little information on fetal or newborn effects.

In a systematic review of all research related to bed rest, Allen and associates (1999) described bed rest as a harmful treatment needing careful evaluation. They cautioned care providers when they noted "the indications for which bed rest should be prescribed, and for how long, are yet to be defined" (p. 1233). Witcher (2002) concluded that there remains conflicting information about the safety and benefit of bed rest, which creates a dilemma for health care providers.

As a starting point, it is necessary to further explore the topic of bed rest in pregnancy and obtain data on the extent to which it is prescribed or encouraged in

Canada, and to determine whether care providers experience any dilemma about using this therapy.

Chapter 3

METHODOLOGY

Framework

This research is embedded within a framework of decision-making and decisional conflict. "Decision making is the process of choosing between alternative courses of action (including inaction)" (O'Connor et al., 2002, p. 570). There is a fundamental premise that health care providers caring for women deemed to be at risk for preterm birth must make decisions in conjunction with these women about whether or not to recommend some form of activity restriction. The uncertainty surrounding the decision to prescribe bed rest, while knowing that there are inherent physiological and psychosocial risks in this course of action and also believing that not prescribing the therapy may potentially lead to another set of risks, may result in decisional conflict for some care providers. Conversely, decision making without any conflict may occur when valued outcomes are maintained and the decision maker avoids undesirable consequences.

Janis and Mann (1977) did the original work on the construct of decisional conflict and they defined decisional conflict as the "simultaneous opposing tendencies within the individual to accept and reject a given course of action" (p. 47). They described the prominent symptoms of this conflict as hesitation, vacillation, feelings of uncertainty, and signs of acute emotional stress. The general feeling of "distress" is the key subjective characteristic of those faced with a decision. O'Connor (2002) defined

decisional conflict as the uncertainty about which course of action to take, especially when choice among competing actions involves risk, loss, regret, or challenge to personal life values. Sjoberg (1983), wrote that decisional conflict is a "situation of choice where no one alternative of action is certain to be best in all possible respects and under all conceivable future states" (p. 383), and he characterized conflict as occurring when there is a possibility that negative events will occur as a result of the decision or there will be regret following the decision. Carpenito (2001) defined decisional conflict as "the state in which an individual/group experiences uncertainty about a course of action when the choice of options involves risk, loss, or challenge to personal life values" (p. 312) and similar to O'Connor (2002) affirmed that the defining characteristic is the verbalized uncertainty about choices. Légaré and colleagues (2003b) summarize by saying that "decisional conflict is influenced by inadequate knowledge; unrealistic expectations; unclear values; unclear norms; unwanted pressure; inadequate support; and, inadequate personal and external resources about making decisions about health.

The *Decisional Conflict Scale (DCS)* (O'Connor, 1995) measures decisional conflict faced by patients. It has been used and validated for many different clinical situations (O'Connor et al., 2002). An adaptation of O'Connor's *Decisional Conflict Scale* was developed and validated by Dolan (1999) to measure decisional conflict in health care providers (*Provider Decision Process Assessment Instrument [PDPAI]).* Légaré (2003a) translated and validated a French version of the scale *(L'echelle de confort décisionnel du médecin [ECD-M]).* Twelve items are scored from 1 (strongly

agree) to 5 (strongly disagree). Lower scores indicate lower degrees of conflict and therefore greater comfort with the decision (Dolan, 1999).

In an effort to promote consistency around the measurement of decisional conflict and to link the measurements with a body of theory, Légaré and colleagues (2003c) investigated the relationship between O'Connor's (1995) *DCS* and Dolan's (1999) *PDPAI*. They set out to determine if the care providers' *PDPAI* scores could be correlated with the patients' *DCS* scores in the area of hormone replacement therapy (Légaré et al., 2003c). They divided the *PDPAI* score by 12 to conform to the patient *DCS* score. This helped them understand more about what the *PDPAI* score meant as Dolan had only indicated that higher scores meant higher decisional conflict, but no further research about the correlation between the score and levels of conflict was located. O'Connor (1999) reported that scores of 2 or lower on the *DCS* were associated with those who make decisions and scores of 2.5 or greater were associated with those who delay decisions.

Understanding whether decisional conflict exists around recommending activity restriction for women at higher risk of preterm birth is an important component of this study as there is little evidence from randomized trials to guide care providers in their decisions.

Methodology

To address the research question, survey research was used. Brink and Wood (1998) support the use of descriptive research when a concept is unknown or

understudied, and they advocate for exploration and description before proceeding to study the phenomenon at an explanatory or predictive level. A self-administered postal survey was used to address the following research questions: Under what conditions do family physicians, obstetricians and midwives recommend the use of bed rest or some level of activity restriction when a woman is at risk for preterm birth? Related questions included:

- What do obstetricians, family physicians and midwives believe about the efficacy of bed rest and activity restriction for women at risk of preterm birth?
- What are the usual practices of obstetricians, family physicians and midwives in recommending bed rest for women at risk of preterm birth?
- What concerns do obstetricians, family physicians and midwives have about the side effects associated with bed rest?
- What are the perceptions of obstetricians, family physicians and midwives of women's compliance with their recommendations for therapeutic bed rest?
- Do obstetricians, family physicians and midwives have any degree of decisional conflict when recommending bed rest for women at risk of preterm birth?

Although other methods, such as telephone and Internet surveys were considered, obtaining telephone numbers and/or e-mail addresses for all participants would have been both logistically difficult and costly. No comprehensive database of e-mail addresses was found. While theoretically, a mail announcement of an Internet-based survey could have been conducted, the percentage of target participants with access to

the Internet is unknown, whereas mail is guaranteed to reach almost everyone. As well, there are issues associated with confidentiality and security of data for Internet-based surveys (Biemer & Lyberg, 2003). One major advantage of a mail over telephone survey is that it does not generate interviewer variability (Biemer & Lyberg, 2003). Mangione (1995) recommends a mail survey when the:

- research sample is widely distributed geographically;
- research budget is modest;
- research subjects need time to think about their answers;
- questions are written in a closed-ended style;
- research sample has a moderate to high investment in the topic;
- list of research objectives is modest in length;
- research subjects require privacy in answering the survey.

The above criteria reflect the characteristics of the target population, objectives and budget for this study.

Sample

The population of interest for this study were obstetricians, family physicians, and midwives providing prenatal care in Canada. As any woman is potentially at risk for preterm birth, and as a great proportion of preterm birth takes place in low-risk populations (Sprague, Stewart, Niday, Nimrod & Walker, 2003), family physicians and midwives who care for low risk women as well as obstetricians who care for women with all levels of risk, were included in the sample.

A proper sampling frame is one of the most important aspects of obtaining a representative sample. To ensure representativeness of the physician sample, proportionate stratified random sampling was used. That is, the sample was stratified by region and by practitioner group to ensure that the size of the sample taken from each stratum was proportionate to the number of practitioners in each region. An example of how this was calculated is provided in Appendix A. The physician groups included obstetricians and family physicians. The regions were British Columbia; Western provinces (Alberta, Saskatchewan and Manitoba); Ontario; Quebec; Atlantic provinces (New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland); and the North (Northwest Territories, Yukon, and Nunavut). Practice patterns were obtained for each region (i.e., percentage of obstetricians and family physicians practising in each region) from the Canadian Medical Association data compiled by *Scott's MD Select*, so that a proportionate random sample of each group could be drawn from each region.

The physician mailing list was obtained from Scott's Directories 2004-2005 *MD Select* program. This program uses the Canadian Medical Directory's in-depth information on Canadian physicians, combined with retrieval software, to allow for searching by speciality. The directory is updated in July of each year. From the software, only physicians who indicated they were either obstetricians or family physicians/general practitioners with an interest in obstetrics were used. The Canadian Medical Association list is comprehensive in that it captures membership in all provincial medical associations.

It was not possible to do a proportionate stratified sampling process for the midwifery group. The midwifery sample was obtained in February 2005 from the active registered member list of each of the provinces where midwifery was regulated (i.e., British Columbia, Alberta, Manitoba, Ontario, Quebec, and the Northwest Territories/Yukon). Although a total list of midwives in Canada is available through The Canadian Midwifery Association, they would not release their list due to privacy concerns, despite ethical approval for the study. The lists of midwives in five of the six areas and their mailing addresses were obtained from the websites of the midwifery associations in each province. A follow-up communication was done with each of the associations to ensure the lists were current. The only province where information was not released in a similar manner to the other areas was Quebec. In Quebec, midwives are employed by individual *Maisons de naissances*. Due to privacy legislation, the midwifery association in Quebec would not release individual names or their mailing list. Instead they released the phone numbers and addresses of the eight different *Maison de naissances* in the province. Each of these centres was contacted, and through the Executive Director, the request was made for the lists. Six of the eight centres released the names of midwives working in their birth centres.

Sample Size

For survey research, the sample size determines the precision with which population values can be estimated. In this descriptive study, where no hypothesis testing was planned, the traditional method of determining sample size did not apply

because a power calculation was not required. Sample size was based on having enough participants to minimize sampling error. Sampling error refers to the difference between the estimate derived from a sample survey and the true value that would result should the entire population provide data (Aday, 1996; Fowler, 2002). Methods to minimize sampling error include using probability sampling, having as large a sample size as possible, and ensuring that the sample will accurately reflect the diversity of practice that exists.

The sampling strategy for the physician group was designed to meet these guidelines. The physician sample was selected from 6 regions across the country stratified by proportion of practitioners in each region. Once the practice patterns and proportions were established, random sampling occurred. Sampling 10 percent or more of a population can have a discernible effect on sampling error estimates (Fowler, 2002). The total estimated sample from which a probability sample could be drawn in the physician group was 3864. To minimize problems with attrition from a 10 percent sample due to care providers who may have changed their status and not be practicing obstetrics or care providers on medical or other types of leave, 15 percent of the population was contemplated for the sample. A 15 percent sampling strategy required 580 completed questionnaires. Due to the potential for up to a 50 percent rate of non-responders in this group, the physician sample was doubled to ensure that the sample size was sufficient. In areas where populations were small (e.g., PEI, northern Canada), the total population was included. Thus, the total number in the physicians group that was sent a survey was 1170 (Appendix A).

Because the numbers of midwives across the country are small, and a total list could not be obtained, the decision about sample size was made by trying to ensure representativeness in the areas where midwives were practising. In each province, except Ontario, the total population was used. In Ontario, because a large number of midwives were in practice, a random sample was recruited. Thirty percent of Ontario midwives were sampled, using the same rationale as for the physicians group. Therefore, the total number of midwives who were sent a survey was 267.

The total possible sample size for the physician and midwifery groups was 1437. Using a conservative estimate of sampling error that is based on the proportion comprised of a 50:50 split on a yes-no question (i.e., Do you use bed rest?), both Dillman (2000) and Rea and Parker (1997) indicate that a completed sample of at least 350 participants will provide a 5 percent margin of error and a 95% confidence level.

Methods and Instrument

This project consisted of two phases. Phase 1 was the development and testing of the survey instrument. Phase 2 was the distribution of the survey and analysis of the responses.

Phase 1

An extensive review of the literature, the expertise of the research team, and an assessment of a previous questionnaire used to survey physicians about prescribing bed rest (Maloni et al., 1998) were used as the basis for developing a preliminary draft of

the survey instrument. As a measure of decisional conflict, the *Provider Decision Process Assessment Instrument* (Dolan, 1999) was included within the survey (Question 9).

The goal of writing a question for a self-administered survey is to have each participant interpret the question in the same way, be able to respond accurately, and want to answer the question (Dillman, 2000). Principles from Dillman's Tailored Design Method (2000) were used to guide the look and feel of the survey instrument. Once the initial draft was completed, further refinement of the instrument was done via feedback from a Focus Group. Four care providers from the disciplines to be sampled provided feedback on question wording, ordering, relevance, and length. Changes were made based on their feedback. An Expert Review Panel was then established to assess content validity. This panel consisted of four representatives from the obstetrician/gynecologist group, two representatives from the family medicine group, and three representatives from the midwifery group (Appendix B). The panel members were a combination of researchers and clinicians so as to obtain feedback from both perspectives.

Validity

Face and content validity of the survey tool were assessed prior to commencing the survey. An instrument is said to have face validity when it appears adequate to collect the data needed for the project (Nieswiadomy, 2002). Lynn (1986) described face validity as a non-statistical assessment of the logical tie between the elements or

items in the instrument and its purpose. Face validity is the easiest, most subjective, and least rigorous assessment of validity, generally determined by experts in the content area. In this study, face validity was assessed and deemed to be adequate through consensus of the research team and consultation with the Focus Group and the Expert Review Panel.

Mishel (1998) described content validity as the representation of a specific universe of content. Experts in the content area evaluate the questions for representativeness of all the questions that could be asked about the topic. To help reduce some of the subjectivity associated with establishing content validity, Mishel (1998) recommended that at least three experts in each content area assess the content. The Expert Review Panel was used to support content validity once the questionnaire was in a final draft format. The group was given the Content Validity Index (Lynn, 1986) (Appendix C). A pre-set percentage agreement of 80 percent, as suggested by Knapp (1985) and Lynn (1986), was used to decide whether items were retained.

Construct validity refers to how well an instrument conforms to theoretical concepts (constructs) concerning the entity under study (Hulley, Martin & Cummings, 2001). The most abstract concept in this survey is that of decisional conflict. Construct validity has been assessed for the *Provider Decision Process Assessment Instrument* (Dolan, 1999), which measures decisional conflict. This instrument is a 12-item questionnaire that measures a health care provider's degree of comfort with a medical decision. Dolan developed this tool by adapting O'Connor's (1995) patient *Decisional Conflict Scale* so that it would reflect the same issues from the health care provider's

perspective. All items are answered on a 5-point Likert-type scale, and responses range from strongly agree to strongly disagree. A summary score is calculated by adding the responses to the individual items after reversing the scoring for items 1, 2, 4, 5, and 6 to make the direction of all the responses consistent. Construct validity was determined by testing for a negative correlation between the index score and measures of decision satisfaction. Dolan hypothesized a negative correlation between the decision conflict and the decision maker's satisfaction with the decision. The negative correlations ranged from –0.53 to –0.67.

Non-random or systematic error affects the accuracy (validity) of a study. Observer bias, subject bias and instrument bias can lead to this type of error (Hulley et al., 2001). In a self-administered survey that uses no mechanical measurements or instruments, the potential threat to accuracy is subject bias, or the potential for subjects to react differently because they are part of a research study (known as the Hawthorne Effect). Although the researcher has little control over this source of error, in a self-administered and anonymous survey, there should be less risk of this threat to validity. The participants were not taking part in an experiment, no feedback was being provided to them, there were no expectations of them more than completing the survey, and the data could not be linked back to them. There were also no rewards or disincentives to influence their opinion.

Reliability

Reliability refers to the precision or accuracy of a measurement tool. An instrument is said to be reliable if it is a true measure of an attribute. Aspects of reliability include internal consistency, stability over time and equivalence. The internal consistency of the *Provider Decision Process Assessment Instrument* that was included within the survey was calculated (Dolan, 1999). A Cronbach's alpha of 0.90 (95% CI = 0.87 – 0.92) was reported. The internal consistency for the French version (*ECD-M*) was 0.82 (95% CI = 0.81- 0.83) (Légaré, 2003a). This tool has not previously been used with a midwifery population but Dolan believes that it is applicable to any health care provider (personal communication, December 2003). As decisional conflict might be different for each professional group, the internal consistency of the instrument for the obstetrician, family physician and midwifery groups was assessed independently.

A method for establishing stability of a tool over time is by completing test-retest procedures. However, stability indicies are most appropriate for more enduring characteristics such as personality and abilities (Polit, Tatano-Beck & Hungler, 2001). Testing for equivalence is used when different observers or raters are used. Since this is a self-administered survey, testing for equivalence was not done.

Random error (also known as chance error) leading to problems with reliability is related to the observer, the subject or the instrument (Hulley et al., 2001). In a self-administered survey, there is no mechanical instrument or observer. Therefore, the researcher needs to be concerned with subject variability and potential problems with

the survey tool. Subject variability refers to biologic variability due to issues like mood or hunger. In a self-administered survey, no control over subject variability is possible.

To improve precision in studies utilizing a written instrument, refining the instrument is important. The four Focus Group members reviewed a draft of the questionnaire. They provided input on question wording, ordering, relevance, and length. Modifications to the survey tool and cover letter were made based on their feedback. Once a final draft of the instrument was ready, pre-testing was done by a group of nine perinatal care providers who were all members of the Society of Obstetricians and Gynaecologists of Canada's Managing Obstetrical Risk Efficiently ($MORE^{OB}$) Program. Five obstetricians, three family physicians and one midwife were given the questionnaire to complete, two of whom completed it in French (Appendix B). They were asked to go through the questionnaire and answer all applicable questions. At the end they were asked to indicate how long the process took, if they ever wanted to stop answering the survey, if they found any of the questions offensive, and, whether they would be likely to complete this survey if received in their office.

All the physicians and midwives who participated in the Focus Group, the Expert Review Panel, and the pretesting were excluded from the final sampling frame.

In the questionnaire design phase, other important issues, especially related to physician groups, are the length of the survey and the design or "look and feel" of the questionnaire. Field and colleagues (2002) reviewed the evidence about the use of Dillman's Tailored Design Method (2000) in improving physician response rates to surveys. They concluded that details of questionnaire design and the impact on

response rates have received almost no attention from researchers. They recommended that, until the research gap in this area is filled, researchers conducting surveys of physicians should include all components of the Dillman protocol wherever feasible. This survey used procedures described in Dillman's (2000) Tailored Design Method.

Once the survey tool and letters of correspondence were completed (Appendices D–J), they were translated into French and then reviewed by two Francophone experts in perinatal care (one nurse and one physician). Very minor grammatical changes were made following their reviews. Translation did not alter the look or flow of the questionnaire, as the French translation did not change the spacing.

Phase 2

The Population Research Laboratory at the University of Alberta was contracted to administer the survey. They conducted the random sampling process for the physician group and the Ontario midwifery group, and managed all the correspondence and data collection for the survey. The process for selecting the random sample of the physician group was as follows:

1. The lists of physicians from the *MD Select database* were exported into a format that could be recognized by SPSS.
2. The database was sorted to be in random order employing a random seed. Exclusions to the list were removed (i.e., physicians who took part in the Focus

Group, Expert Review Panel, Pretest Group, or the Research Team were excluded).

3. Using the *Data - Select Cases* feature, SPSS selected a random sample of cases as instructed. The Northwest Territories and PEI were excluded from this process as the total population was used in each of these areas due to their small numbers. An example of this process is demonstrated with the family physician participants in Ontario. Appendix A indicates that a sample of 226 is required from the total population of 754. To obtain the 226, the population of family physicians from Ontario is first isolated. Then, using the *Select Cases* feature, SPSS can be programmed to randomly select exactly 226 from the total population. This sample of 226 is then identified by study number and converted back into the mailing list.
4. The process of *Selecting Cases* was repeated for each of the required strata.

For the Midwifery sample in Ontario, the same process was applied.

Response rates for any survey, particularly those administered via mail, are a concern. Nonresponse error is the single biggest problem for any survey, but particularly for mail surveys (Mangione, 1995). Theoretically, this concern is greater when the survey is administered to busy professionals, many of whom may not open their own business mail. In an analysis of physician response rates to mailed questionnaires reported in published articles, Cummings and colleagues (2001) found

the average response rate to be 61 percent overall and 52 percent for large sample surveys. The University of Alberta Population Research Laboratory estimated a response rate of up to 50 percent when a process of five-point contact with participants is used as suggested below (Fong, D. research manager – personal communication, January 8, 2004). In Canada, other surveys of perinatal care providers have yielded response rates of 50 percent for questions related to vaginal birth after cesarean (Brill et al., 2003), 47 percent for those related to management of thrombophilia (Rodger et al., 2002), and 78 percent for those related to patient-physician sexual involvement (Lamont & Woodward, 1994). The physician group in this survey was over-sampled by 100 percent to increase the likelihood of obtaining a meaningful response rate.

Strategies suggested by Dillman (2000) and Edwards et al. (2002) to improve response rates were incorporated into this survey. Every effort was made to ensure that the questions were respondent-friendly by including questions that were clear and easy to understand in an order that made sense to participants and by designing a layout that was visually appealing. There were five contacts by first-class mail with study participants. This included: 1) a pre-notice letter about the survey, 2) a copy of the survey and cover letter, 3) a thank-you/reminder postcard, 4) a replacement questionnaire for non-responders, and 5) a final questionnaire and letter for non-responders (Appendices D to J). Postage-paid, pre-addressed return envelopes and a FAX number for those who chose to return the survey by this method were included with all questionnaires. The University of Alberta letterhead was used for all participant contact. The survey was available in both French and English to ensure that

Francophone participants were more likely to complete the survey. The *MD Select* list for the physician group identified preferred language of correspondence for each participant. For the midwifery group, all the midwives received the questionnaire in English, except for those living in Quebec.

In preparing the early draft of the survey, informal conversations were held with physicians and midwives about surveys that cross their desks and what persuades them to complete the survey. Length of survey and the perceived importance of the survey topic to their everyday practice life were reported to be important. The final survey had 18 questions. In pre-testing the survey, each participant was asked whether or not they believed the survey could be completed in 15 minutes or less. As every perinatal care provider will be faced with the decision of whether or not to ask women to restrict activity during pregnancy, the survey should have appeal for care providers. The cover letter used this rationale to encourage care providers to complete the survey.

Both Dillman (2000) and Edward's group (2002) discussed the use of incentives as a means of improving response rates. In a meta-analysis, the use of monetary incentives more than doubled the odds of a response (Edwards et al., 2002). Dillman (2000) discussed this phenomenon in relation to Social Exchange Theory. The small payment in advance of the participant completing the survey shows that the researcher has trust in the participant. This symbolic gesture of trust may explain why money given prior to survey completion is more effective than the promise of money or a gift following completion of the survey. There is only limited evidence about the use of incentives in a physician population (Field et al., 2002). No studies were found that addressed this in

a midwifery population. While a lottery for a weekend vacation increased family physician response rates by 6.4 percent in one study, there were insignificant changes in response rates in other studies (Field et al., 2002). Due to the lack of data to support this practice in physician groups and the limited budget for the project, no incentives were offered.

Ethics

The study received ethics approval from the Health Research Ethics Board (HREB) at the University of Alberta (Appendix K). All participants were informed they were free to choose whether or not to return their survey and that returning of the survey implied their consent to participate. To ensure confidentiality of the participants' survey responses, no names appeared on the returned surveys. A unique identifier was used as a participant code. A master list that linked participant code numbers with participant names was kept in a secure area by the Population Research Laboratory staff at the University of Alberta. Participant names were never linked to the data. Only aggregate data will be presented in any presentation or manuscript.

All participants were advised that if data were to be used in any future studies, approval from an appropriate ethics committee would be required.

Summary

Knowing more about how and why care providers recommend bed rest or activity restriction in women at risk for preterm birth is an important first step in planning

further studies on the efficacy of this practice. The survey by Maloni, Cohen and Kane (1998) of care providers in the United States, although of great importance, was small and only reflected obstetrician and maternal-fetal medicine practices. As all the data that currently exist are from American studies, they may not accurately reflect the Canadian care providers' perspectives. Results from this study will be used to contribute new information to what is known about this topic by providing data on the perspectives and practices of two groups of care providers (family physicians and midwives) who have not been surveyed on this topic before and who are seeing many women with signs and symptoms of preterm labour before they are ever referred to an obstetrician. Information will also be provided on the degree of decisional conflict in care providers, which is important because best practice evidence is lacking.

Chapter 4

RESULTS

Analysis of Results

Results are reported for the three separate groups of respondents to the survey (obstetricians, family physicians and midwives). The sample is described using descriptive statistics, tables and graphs. When describing the responses to questions on Likert scales, some of the categories were grouped for clarity. Comparisons between groups were made using chi-square testing for categorical data and analysis of variance for continuous variables that were normally distributed. When reporting on relationships between two variables, a p-value of 0.05 was used to assess whether or not the relationship was significant (Altman, 1991). Data entry and analysis was conducted using the SPSS for Windows version 12 software package.

Validity Testing

The draft survey was subjected to a content validity assessment. The Expert Review Panel (Appendix B) completed the content validity assessment using Lynn's (1986) Content Validity Index (CVI). Of the twelve people invited to complete the CVI, ten accepted, and in the end, eight completed the tool: three obstetricians, two family physicians and three midwives. Lynn suggested that a minimum of five experts provides protection against chance agreement. The individual questions as well as the total questionnaire was assessed on a four-point ordinal scale, where 1 represented an irrelevant item and 4 an extremely relevant item. An example of the CVI assessment

questions within the survey tool is presented in Appendix C. Lynn (1986) recommended that an acceptable CVI is the proportion of items that receive a rating of 3 or 4 by the experts. With eight experts reviewing the instrument, at least seven must assign scores of 3 or more to a particular item to establish content validity beyond the 0.05 level of significance based on the standard error of proportion. Of the 22 questions assessed, 20 items had scores of 3 or 4 from the experts, for a rating of 90 percent. Of the two remaining questions, one received a rating of 75 percent and one 62.5 percent. The comments for these questions were incorporated, as were other suggestions from the Expert Panel, and minor revisions were made. For the total questionnaire, 87.5 percent gave ratings of 3 or 4. One person did not reply to this question on the form, but when followed up after, indicated that the questionnaire was very relevant. Therefore, after minor revisions, the questionnaire was ready for translation and pre-testing.

Phase 2 – Reliability Testing

In the pre-test of the questionnaire by nine multidisciplinary participants, the average time taken by respondents to complete it was 11.9 minutes. No one indicated wanting to stop before completing the questionnaire. Only one person indicated that he/she found a question offensive, but there was no note on the questionnaire to indicate which question it was and all the questions were completed. Only one person indicated that he/she would be unlikely to complete the survey if it came to their office. Upon questioning, it was indicated that he/she didn't usually answer surveys that were more than three to four questions.

For the *Provider Decision Process Assessment Instrument (PDPAI)*, the Cronbach's alpha was 0.85 for the three professional groups combined. Similar values were obtained when looking at the reliability by language: Cronbach's alpha for the English version was 0.83 and for the French version was 0.88. As this scale had not previously been used with care providers other than physicians, the reliability was assessed for each group. The Cronbach's alpha was 0.84 for obstetricians, 0.87 for family physicians and 0.83 for midwives, indicating acceptable internal consistency.

Study Period

Data collection for the survey took place from March till May 2005. The mail-out dates and distribution numbers for the survey were as follows:

March 1 – Pre notice letter (n=1437)

March 8 – First mailing of questionnaire (n=1437)

March 18 – Reminder postcard (n= 1347)

March 30 – Second mailing of questionnaire (n=1090)

April 12 – Final mailing of questionnaire (n= 905)

Survey Data

The staff at the University of Alberta Population Research Laboratory completed the data entry and cleaning. To check the accuracy of the entered data, ten percent of the completed questionnaires were randomly selected and checked against the entered data. For each questionnaire, there were up to 150 data entries (depending on skip patterns). Lab personnel reported finding only 3 data entry errors in the 50 questionnaires checked.

There were 35 surveys (6%) returned that had an ambiguous answer to a question. In most cases, the respondent answered a question twice by ticking two answers when asked for one. To determine the best way to reduce bias in arbitrarily choosing one answer over the other, I consulted with Dr. Jack Williams, a modeling methodologist in Epidemiology and health services research. He previously held a senior position at the Institute for Clinical Evaluative Services (ICES) in Toronto and was Vice-President of Research at the Toronto Rehabilitation Centre. His advice, which I followed, was to look at all the questionnaires and determine first if there was anything about these respondents' questionnaires that looked atypical. Three obstetricians, 13 family physicians and 19 midwives from various parts of the country had double data entry. Since nothing was atypical about these respondents (e.g., they were not all from one province or one occupational group), he advised flipping a coin to select the final answer for answers that were close together (e.g., choosing 2 categories beside each other on a Likert-type scale). If answers were far apart (e.g., both a 1 and a 5 were ticked on a scale ranging from 1 to 5) the answer was discarded and classified as missing data. The personnel at the Population Research Laboratory did the coin flip

with Dr. Beverley O'Brien and me in attendance to witness the fairness of the procedure.

With all groups, the biggest issue for double entry was the classification of their practice settings (Question 17 on the survey). Most midwives practise in a number of settings as they attend home births as well as hospital births, and they may be associated with more than just one level of care or type of hospital. The same issue arose for family physicians who can attend at a number of hospitals as well as clinics. A decision was made that when a teaching hospital was checked as one of the responses, it would be taken as the answer so that an accurate representation of the number of practitioners working in teaching institutions would be obtained.

Response Rate, Usable Data and Demographic Profile

Figure 1 is an overview of the response rate and usable data from the survey. Of the original sample (n=1437), 813 (56.6%) returned surveys. Of these, 269 (18.7%) indicated they did not provide prenatal care and were deemed ineligible for the study leaving 1168 eligible potential respondents. Twenty-seven (2.3%) responded indicating they were not interested and 624 (53.4%) chose not to respond. Of the 517 (44.3%) who completed the survey, one person had to be excluded because he/she did not indicate their occupational group. Therefore, the final number of completed surveys available for analysis was 516 (44.2%) and included 170 obstetricians, 206 family physicians and 140 midwives.

The survey completion rate according to provider group was 170 of 358 (47.5 %) obstetricians, 206 of 547 (37.6%) family physicians, and 140 of 263 (53.2%) midwives. There were respondents from each provider group from each region of the country (British Columbia, West, Ontario, Quebec, Atlantic, and North) except for the midwifery group because at the time of the survey there was no legislation to regulate midwifery in any of the Atlantic Provinces. While it was anticipated that survey results would be compared by region of the country, in many cases the numbers were too small for this to be done appropriately. In regards to language, 402 respondents completed the survey in English (77.9%) and 114 in French (22.1%). A demographic profile of the respondents is presented in Table 2.

The mean age of respondents was 45.2 years (SD 9.1). Using analysis of variance, no significant differences in mean age among the three care provider groups ($F [2,508] = 2.69$, $p = 0.07$) was demonstrated. In terms of gender, 367 (71%) respondents were female, and 146 (28.3%) were male. The largest numbers of female respondents were midwives (98.6%) and family physicians (72.3 %). In the obstetrician group, 52 percent of respondents were male and 47 percent female.

The median number of years providing maternity care was 15 for obstetricians (range 1 to 40), 16.5 for family physicians (range 1 to 48) and 10 for midwives (range 1 to 45). Three hundred and sixty-seven care providers (71%) classified themselves as practicing in urban or suburban centers. The number of care providers practising in other areas included 96 (18.6%) in small towns, 45 (8.8%) in rural settings and 7 (1.3%) in isolated or remote areas. In regards to practice settings, 88 of 170 (51.8%) obstetricians practised in teaching hospitals compared to 46 of 206 (22.3%) family

physicians and 24 of 140 (17 %) midwives. Many care providers practised in community hospitals: 44.7 percent of obstetricians, 45.6 percent of family physicians and 29.3 percent of midwives.

Figure 1 - Response Rate And Usable Data

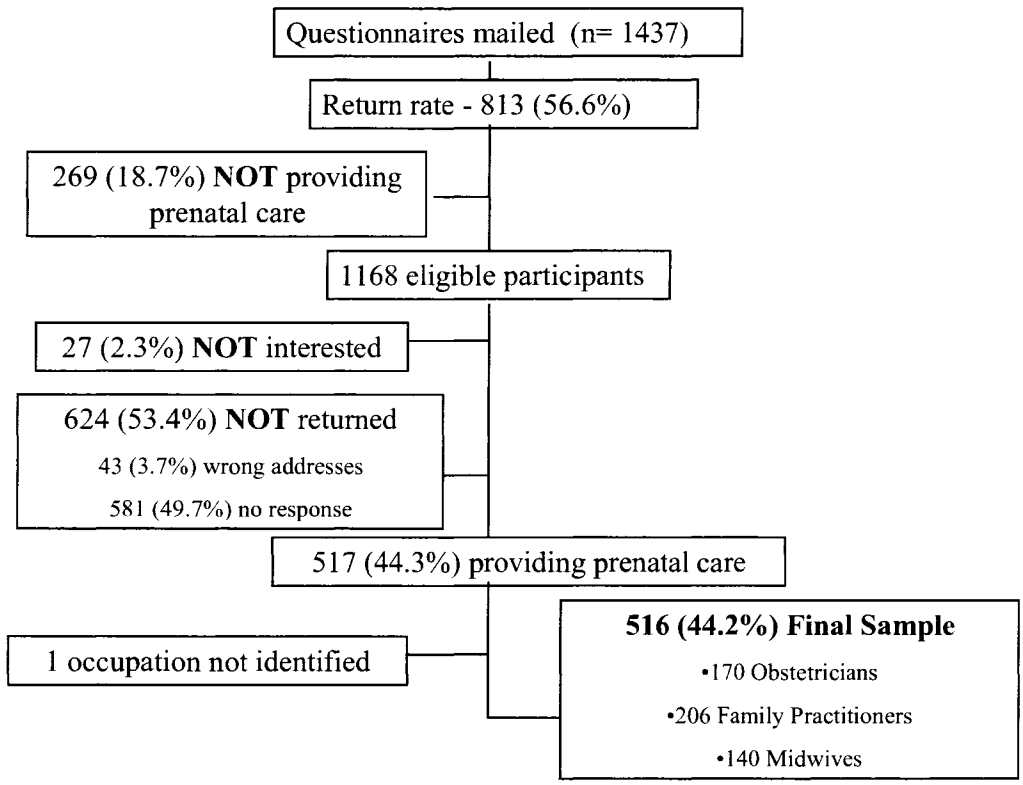


Table 2 – Demographic Profile of Participants

	Obstetricians (n=170)		Family Physicians (n=206)		Midwives (n=140)	
Mean Age[a] (range)	46	(30-70)	46	(28-80)	44	(25-63)
Median Number of Years Providing Maternity Care (range)	15	(1-40)	16.5	(1-48)	10	(1-45)
Gender[b] n (%)						
Male	88	(51.8)	57	(27.7)	0	
Female	80	(47.1)	149	(72.3)	138	(98.6)
Location n (%)						
Urban	133	(78.2)	136	(66)	98	(70)
Small Town	26	(15.3)	46	(22.3)	24	(17.1)
Rural	11	(6.5)	19	(9.2)	15	(10.7)
Isolated	0		5	(2.4)	2	(1.4)
Practice Setting n (%)						
Teaching hospital	88	(51.8)	46	(22.3)	24	(17.1)
Community hospital	76	(44.7)	94	(45.6)	41	(29.7)
Not associated with a hospital	2	(1.2)	24	(11.7)	15	(10.7)
Other	4	(2.4)	42	(20.4)	58	(41.4)

[a] Missing data for age – four obstetricians, one midwife
[b] Missing data for gender – two obstetricians, two midwives

Respondents were asked to identify how often they see women at risk for preterm birth. A profile is provided in Table 3. Of 170 obstetricians, 126 (74%) indicated that they saw women at risk on a daily/weekly basis as compared to 56 of 206 (27%) family physicians and 18 of 140 (13%) midwives. Just over half of midwives (51.4%) and a third of family physicians (34.5%) indicated that they saw women at risk for preterm birth only 2 to 3 times a year.

Respondents were also asked if their work place had any clinical practice guidelines (CPGs) regarding the use of bed rest for women at risk for preterm birth.

Fourteen of 170 (11%) obstetricians, 17 of 206 (8.3%) family physicians and 24 of 140 (17.1%) midwives indicated they had CPGs on this subject. The rest indicated that there were no guidelines, or they didn't know if there were guidelines on this topic.

Table 3 – How Often Care Providers See Women at Risk For Preterm Birth

How Often?	Obstetrician		Family Physician		Midwife	
	n	(%)	n	(%)	n	(%)
Daily	40	(23.5)	6	(2.9)	3	(2.1)
Weekly	86	(50.6)	50	(24.3)	15	(10.7)
Monthly	33	(19.4)	58	(28.2)	36	(25.7)
2-3 times/Year	7	(4.1)	71	(34.5)	72	(51.4)
No Response	4	(2.4)	21	(10.2)	14	(10.0)
Total	**170**	**(100)**	**206**	**(100)**	**140**	**(100)**

Each research question will be addressed in the remaining analysis.

Question 1 – What Do Obstetricians, Family Physicians and Midwives Believe About the Effectiveness of Bed Rest and Activity Restriction for Women At Risk of Preterm Birth?

Respondents were asked to rate on a 5-point scale, of 1 (excellent) to 5 (poor), the effectiveness of bed rest and activity restriction in preventing preterm birth. When the categories were collapsed, about two-thirds of each professional group responded that the effectiveness of bed rest was in the fair to poor range (Table 4). Twelve of 170 (7%) obstetricians, 35 of 206 (17%) family physicians and 13 of 140 (9.3%) midwives

indicated that bed rest was excellent to very good for preventing preterm birth. About 20 percent of all groups rated bed rest as good for preventing preterm birth. There were no differences between the care provider groups in those who indicated that bed rest was fair or poor for preventing preterm birth as opposed to the other categories (χ^2 = 2.53, df 2, p=0.283). There was a significant difference among the care provider groups with respect to those who considered bed rest as excellent or very good as opposed to the rest of the categories (χ^2 =9.97, df 2, p=0.007). There were many comments from care providers acknowledging that while bed rest may not work, it is the "only thing we have".

When asked to rate the effectiveness of activity restriction in preventing preterm birth using the same scale, 84 of 170 (49.4%) obstetricians, 115 of 206 (55.8%) family physicians and 58 of 140 (41.4%) midwives rated it as fair or poor. Twenty-two (12.9%) obstetricians, 42 (20.4%) family physicians and 35 (25%) midwives rated it as excellent to very good. As with the data on bed rest, the only significant difference between the groups was for those who rated activity restriction as excellent or very good as opposed to the other categories (χ^2 =5.97, df 2, p=0.05). When asked for comments about bed rest and activity restriction, many care providers indicated that they believed that activity restriction or asking women to "slow down" could be useful.

Table 4 – Effectiveness of Bed Rest and Activity Restriction for Preventing Preterm Birth

	Obstetricians		Family Physicians		Midwives	
Rating	n	%	n	%	n	%
Bed Rest						
Excellent/Very good	12	7.1	35	17	13	9.3
Good	38	22.4	40	19.4	27	19.3
Fair/Poor	117	68.8	131	63.6	96	68.6
Missing	3	1.8	0	0	4	2.9
Total	**170**	**100**	**206**	**100**	**140**	**100**
Activity Restriction						
Excellent/Very good	22	12.9	42	20.4	35	25
Good	56	32.9	48	22.3	43	30.7
Fair/Poor	84	49.4	115	55.8	58	41.4
Missing	8	4.7	1	0.5	4	2.8
Total	**170**	**100**	**206**	**100**	**140**	**100**

Question 2 – What Are The Usual Practices of Obstetricians, Family Physicians, and Midwives in Recommending Bed Rest For Women at Risk of Preterm Birth?

A number of questions were asked so that participants' usual practices when caring for women at risk of preterm birth could be elicited. First, respondents were asked to indicate whether or not they would generally recommend therapeutic bed rest in hospital or at home as part of the care plan for women at risk for preterm birth.

In response to whether they recommended bed rest in the hospital, 60 of 170 (35.3%) obstetricians, 88 of 206 (42.7%) family physicians and 30 of 140 (21.4%) midwives indicated that they generally used this treatment. Larger numbers of care providers recommended bed rest at home: 110 of 170 (64.7%) obstetricians, 144 of 206 (69.9%) family physicians and 73 of 140 (52.1%) midwives. This recommendation for bed rest occurred despite the fact that 68.8 percent of obstetricians, 63.6 percent of family physicians and 68.5 percent of midwives considered bed rest as only a fair to poor prevention strategy.

Some care providers indicated that they never recommended bed rest either in hospital or at home: 47 of 170 (27.6%) obstetricians, 47 of 206 (22.8%) family physicians and 60 of 140 (42.9%) midwives. Using chi-square analysis a significant difference between the groups on this variable ($\chi^2 = 16.58$, df 2, $p < 0.001$) was demonstrated. These respondents were deemed not to prescribe or use bed rest as a therapy and were directed to skip to the demographic questions at the end of the survey. The remaining respondents were the only ones asked to complete relevant questions about how they made decisions related to prescribing bed rest. These included **123 obstetricians, 159 family physicians and 80 midwives.**

Because it was anticipated that recommendations for bed rest would differ with a woman's clinical situation and the gestational age, respondents were given seven different clinical scenarios and asked whether or not they would recommend bed rest if that situation occurred at three different gestational ages: 24 weeks, 28 weeks, and 32 weeks gestation (Table 5).

The clinical scenario with the lowest number of care providers recommending bed rest was Scenario Seven, which referred to a woman who was feeling very stressed at work, had occasional contractions but no cervical changes, and no history of previous preterm birth. Less than 8 percent of the 123 obstetricians and 159 family physicians would recommend bed rest at the three gestational ages for this type of situation. Midwives responded differently in that 13 of 80 (16.3%) reported that they would recommend it at 32 weeks. The clinical situation that generated the highest recommendations for bed rest was a twin pregnancy with evidence of cervical change but no contractions (Scenario 5). All care providers recommended bed rest in this scenario for all gestational ages more frequently than in any of the other clinical scenarios. Of the 123 obstetricians who would recommend bed rest, 101 (82.1%) would recommend bed rest at both 24 and 28 weeks gestation and 71 (57.7%) at 32 weeks gestation. For family physicians, 97 of 159 (61%) would recommend bed rest at 24 weeks, 111 (69.8%) at 28 weeks and 101 (63.5%) at 32 weeks. Midwives were less likely than physicians to recommend bed rest in this situation for all gestational age groupings: 36 of 80 (57.5%) at 24 weeks, 55 of 80 (68.8%) at 28 weeks and 45 of 80 (56.3%) at 32 weeks.

Cervical changes, as opposed to other risk factors for preterm labour and birth such as contractions in the preterm period or a previous history of preterm prelabour rupture of the membranes (PPROM), led to higher percentages of care providers who would recommend bed rest at all gestational ages in both singletons and multiples. In regards to the care provider groups, obstetricians as compared to family physicians and midwives were more likely to recommend bed rest in all scenarios at 24 weeks gestation

(except Scenario 7), and in 5 of the 7 scenarios at 28 weeks gestation (except Scenarios 2 and 7). Midwives were least likely to recommend bed rest in all scenarios except Scenarios 6 and 7.

In relation to recommendations for bed rest at different gestational ages, in most cases fewer care providers would recommend bed rest at 32 weeks as compared to 24 weeks and 28 weeks for the same clinical scenarios.

In the comments section for the question about preferences between bed rest and activity restriction, 10 obstetricians, 27 family physicians and 32 midwives reported that they ask a woman to reduce work and home activities or use rest versus bed rest in many of these scenarios.

Table 5 – Care Providers Recommending Bed Rest

Scenarios	24 weeks - YES to Bed Rest						28 weeks - YES to Bed Rest						32 weeks - YES to Bed Rest					
	OB (n= 123)		FP (n= 159)		MW (n= 80)		OB (n= 123)		FP (n= 159)		MW (n= 80)		OB (n= 123)		FP (n= 159)		MW (n= 80)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
1 Previous PTB at 26 weeks but no s&s of PTL now	23	(18.7)	23	(14.5)	8	(10.0)	20	(16.3)	23	(14.5)	7	(8.8)	12	(9.8)	18	(11.3)	4	(5.0)
2 Hx of PPROM in 2 pregnancies (28 & 32 weeks) - no cx changes or contractions now	20	(16.3)	19	(11.9)	4	(5.0)	31	(25.2)	54	(34)	19	(23.8)	20	(16.3)	49	(30.8)	16	(20.0)
3 Twin pregnancy - no complications	13	(10.6)	6	(3.8)	1	(1.3)	23	(18.7)	13	(8.2)	5	(6.3)	21	(17.1)	23	(14.5)	7	(8.8)
4 Twin pregnancy - increased uterine activity, but long closed cx	53	(43.1)	51	(32.1)	18	(22.5)	61	(49.6)	71	(44.7)	26	(32.5)	37	(30.10)	67	(42.10)	23	(28.8)
5 Twin pregnancy with evidence of cx change, but no contractions	101	(82.1)	97	(61.0)	46	(57.5)	101	(82.1)	111	(69.8)	55	(68.8)	71	(44.7)	101	(63.5)	45	(56.3)
6 Singleton pregnancy with cx change but no contractions	86	(69.9)	67	(42.1)	36	(45.0)	85	(69.1)	77	(48.4)	46	(57.5)	52	(69.8)	67	(42.1)	34	(42.5)
7 Feeling very stressed at work, occasional contractions, no cx changes, no hx of PTB	5	(4.1)	8	(5.0)	4	(5.0)	6	(4.9)	9	(5.7)	5	(6.3)	9	(7.3)	12	(7.5)	13	(16.3)

PTB = preterm birth

PTL = preterm labour

cx = cervix

hx = history

s&s = signs and symptoms

Note. Excludes the 47 obstetricians, 47 family practitioners and 60 midwives who stated they never recommend bed rest either in hospital or at home

To further explore the specifics of the type of bed rest or activity restriction that participants would recommend, they were asked to consider three other clinical scenarios in more detail:

1. A woman with a previous preterm birth at 31 weeks gestation is having a routine prenatal visit at 28 weeks. There have been no pregnancy complications. Occasional contractions but no other symptoms. She works in an office that she feels is a moderately stressful environment. She has a stable family environment and good support. A follow-up appointment and an ultrasound are scheduled.

2. A woman is pregnant for the first time with twins. She is at 26 weeks gestation and has been admitted to the hospital with contractions. Cervical length has shortened from 25 mm to 10 mm. Fetal growth and biophysical parameters are normal. If everything stays stable for a few days, she will be discharged home. She asks what you would recommend in terms of activity at home.

3. A primigravid woman at 30 weeks reports regular tightenings and back pain for the last couple of days. During the office visit you can palpate contractions. When you send her for ultrasound, the cervical length is normal.

Participants' decisions about restricting activity in each of these scenarios are reported in Table 6. As in the previous question, the twin pregnancy scenario (Scenario 2) had the highest percentage agreement for some form of activity restriction. Only one person who answered this question would not ask this woman to restrict her activity. In

Scenario 1 (previous preterm birth at 31 weeks gestation, occasional contractions, stressful job, good support) there was less agreement on what should be done. Within the obstetrician group, of those who generally recommended bed rest, 67 of 123 (54.5%) would ask the woman to restrict her activity, as compared to 109 of 159 (68.6%) family physicians and 57 of 80 (71.2%) midwives. In Scenario 3 (primigravida with regular tightenings and back pain, normal cervical length), 61 of 123 obstetricians (49.6%), 109 of 159 (68.6%) family physicians and 46 of 80 (57.5%) midwives would ask the woman to restrict her activity. In Scenarios 1 and 3, family physicians and midwives were more likely to recommend activity restriction than were obstetricians.

Table 6 – Recommendations for Activity Restriction

	RESTRICT Activity[a]						**NO** Activity Restriction[a]					
	OB (n = 123)		FP (n = 159)		MW (n = 80)		OB (n = 123)		FP (n = 159)		MW (n = 80)	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Scenario 1	67	(54.5)	109	(68.6)	57	(71.2)	54	(43.9)	48	(30.1)	20	(25.0)
Scenario 2	121	(98.3)	152[b]	(95.6)	69[b]	(86.3)	1	(0.8)		----		----
Scenario 3	61	(49.6)	109	(68.6)	46	(57.5)	60	(48.8)	48	(30.2)	32	(40.0)

[a] Missing data: Scenario one – 2 obstetricians, 2 family physicians, 3 midwives.
Scenario two – 1 obstetrician, 2 midwives
Scenario three – 2 obstetricians, 2 family physicians, 2 midwives.

[b] 7 family physicians and 9 midwives in Scenario 2 indicated they didn't answer this because they don't manage twins – they refer to a specialist.

Note. Excludes the 47 obstetricians, 47 family physicians and 60 midwives who stated they never recommend bed rest either in hospital or at home

The respondents who indicated they would restrict activity in each of the clinical scenarios were then asked to specify from a list of activities whether they would ask a woman to stop or reduce that activity. There was also a place to indicate if they did not usually address this activity in their discussion with the woman. For each scenario they were also asked to indicate what other resting strategies they would recommend for a woman in this clinical situation. Data are summarized in Tables 7 to 9.

Table 7 - Recommendations for Restricting Activity (Scenario 1)

	Obstetricians (n=69)								Family Physicians (n=111)								Midwives (n=60)							
	Stop		Reduce		NUA[a]		Missing		Stop		Reduce		NUA		Missing		Stop		Reduce		NUA		Missing	
Scenario 1	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Work outside home	21	(30.4)	40	(58)	3	(4.3)	5	(7.2)	41	(36.9)	52	(46.8)	10	(9)	8	(7.2)	14	(23.3)	36	(60)	0	---	10	(16.7)
Work at home[b]	1	(1.4)	40	(58)	15	(21.7)	13	(18.8)	7	(6.3)	64	(57.7)	21	(18.9)	19	(17.1)	6	(10)	23	(38.3)	8	(13.3)	23	(38.3)
Child care	5	(7.2)	48	(69.6)	8	(11.6)	8	(11.6)	0	---	81	(73)	12	(10.8)	18	(16.2)	1	(1.7)	42	(70)	0	---	17	(28.3)
Household tasks[c]	17	(24.6)	45	(65.2)	4	(5.8)	3	(4.3)	25	(22.5)	78	(70.3)	3	(2.7)	5	(4.5)	13	(21.7)	40	(66.7)	0	---	7	(11.1)
Meal preparation	4	(5.8)	37	(53.6)	17	(24.6)	11	(15.9)	4	(3.6)	53	(47.7)	33	(29.7)	21	(18.9)	5	(8.3)	31	(51.7)	5	(8.3)	19	(31.7)
Prolonged standing	26	(37.7)	35	(50.7)	3	(4.3)	5	(7.2)	35	(31.5)	59	(53.2)	9	(8.1)	8	(7.2)	26	(43.3)	29	(48.3)	0	---	5	(8.3)
Walking outside	9	(13)	41	(59.4)	11	(15.9)	8	(11.6)	11	(9.9)	64	(57.7)	17	(15.3)	19	(17.1)	4	(6.7)	31	(51.7)	4	(6.7)	21	(35)
Driving the car	3	(4.3)	28	(40.6)	21	(30.4)	17	(24.6)	3	(2.7)	36	(32.4)	46	(41.4)	26	(23.4)	21	(35)	16	(26.7)	0	---	23	(38.3)
Sexual activity	32	(46.4)	22	(31.9)	4	(5.8)	11	(15.9)	59	(53.2)	30	(27)	11	(9.9)	11	(9.9)	25	(43.1)	21	(36.2)	0	---	12	(20.7)

[a]NUA = Not usually addressed

[b]Work at home was described in the questionnaire as home office work

[c]Household tasks were described in the questionnaire as laundry, cleaning

Note. Sample includes care providers who stated they would restrict activity in Scenario 1. It does not include those care providers (47 obstetricians, 47 family physicians and 60 midwives who indicated that they never recommended bed rest in hospital or at home.

Table 8 - Recommendations for Restricting Activity (Scenario 2)

	Obstetricians (n=123)								Family Physicians (n=152)								Midwives (n=71)							
	Stop		Reduce		NUA[a]		Missing		Stop		Reduce		NUA		Missing		Stop		Reduce		NUA		Missing	
Scenario 1	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Work outside home	119	(96.7)	2	(1.6)	0	---	1	(0.8)	142	(93.4)	9	(5.9)	0	---	1	(0.7)	57	(80.3)	12	(16.9)	0	---	2	(2.8)
Work at home[b]	69	(56.1)	46	(37.4)	3	(2.4)	4	(3.3)	62	(40.8)	77	(50.7)	7	(4.6)	6	(3.9)	27	(38.0)	36	(50.7)	2	(2.8)	6	(8.5)
Household tasks[c]	99	(80.5)	21	(17.1)	1	(0.8)	1	(0.8)	102	(67.1)	49	(32.2)	0	---	1	(0.7)	34	(47.9)	34	(47.9)	0	---	3	(4.2)
Meal preparation	52	(42.3)	60	(48.8)	7	(5.7)	3	(2.5)	53	(34.9)	78	(51.3)	12	(7.9)	9	(5.9)	20	(28.2)	42	(59.2)	3	(4.2)	6	(8.5)
Prolonged standing	91	(74.0)	31	(25.2)	0	---	0	---	114	(75.0)	32	(21.1)	5	(3.3)	1	(0.7)	45	(63.4)	20	(28.2)	3	(4.2)	3	(4.2)
Walking outside	65	(52.8)	52	(42.3)	2	(1.6)	3	(2.5)	59	(38.8)	77	(50.7)	7	(4.6)	9	(5.9)	16	(22.5)	40	(56.3)	3	(4.2)	12	(16.9)
Driving the car	68	(55.3)	42	(34.1)	9	(7.4)	3	(2.5)	48	(31.8)	61	(40.4)	32	(21.2)	10	(6.6)	12	(16.9)	34	(47.9)	15	(21.1)	10	(14.1)
Sexual activity	105	(85.4)	12	(9.8)	4	(3.3)	1	(0.8)	128	(84.2)	16	(10.5)	5	(3.3)	3	(2.0)	51	(71.8)	12	(16.9)	2	(2.8)	6	(8.5)

[a]NUA = Not usually addressed

[b]Work at home was described in the questionnaire as home office work

[c]Household tasks were described in the questionnaire as laundry, cleaning

Note. Sample includes care providers who stated they would restrict activity in Scenario 2. It does not include those care providers (47 obstetricians, 47 family physicians and 60 midwives who indicated that they never recommended bed rest in hospital or at home.

Table 9 - Recommendations for Restricting Activity (Scenario 3)

	Obstetricians (n=63)								Family Physicians (n=111)								Midwives (n=48)							
	Stop		Reduce		NUA[a]		Missing		Stop		Reduce		NUA		Missing		Stop		Reduce		NUA		Missing	
Scenario 1	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Work outside home	23	(36.5)	32	(50.8)	2	(3.2)	6	(9.5)	57	(51.4)	48	(43.2)	3	(2.7)	3	(2.7)	14	(29.2)	26	(54.2)	2	(4.2)	6	(12.5)
Work at home[b]	6	(9.5)	37	(58.7)	9	(14.3)	11	(17.5)	24	(21.6)	61	(55.0)	14	(12.6)	12	(10.8)	5	(10.4)	26	(54.2)	4	(8.3)	13	(27.1)
Household tasks[c]	14	(22.2)	44	(69.8)	2	(3.2)	3	(4.8)	36	(32.4)	69	(62.20	2	(2.7)	3	(2.7)	4	(8.3)	36	(75.0)	0	---	8	(16.7)
Meal preparation	6	(9.5)	36	(57.1)	9	(14.3)	12	(19.0)	13	(11.7)	63	(56.8)	25	(22.5)	10	(9.0)	2	(4.2)	30	(62.5)	4	(8.3)	12	(25.0)
Prolonged standing	16	(25.4)	42	(66.7)	2	(3.2)	3	(4.80	43	(38.7)	55	(49.5)	10	(9.0)	3	(2.7)	15	(31.3)	28	(58.3)	0	---	5	(10.4)
Walking outside	10	(15.9)	41	(65.1)	6	(9.5)	6	(9.5)	23	(20.7)	61	(55.0)	19	(17.1)	8	(7.2)	4	(8.3)	28	(58.3)	4	(8.3)	12	(25.0)
Driving the car	5	(7.9)	32	(50.8)	13	(20.6)	13	(20.6)	17	(15.3)	43	(38.7)	40	(36.0)	11	(9.9)	3	(6.3)	18	(37.5)	14	(29.2)	13	(27.1)
Sexual activity	25	(39.7)	23	(36.5)	5	(7.9)	10	(15.9)	63	(56.8)	33	(29.7)	11	(9.9)	4	(3.6)	18	(37.5)	20	(41.7)	4	(8.3)	6	(12.5)

[a]NUA = Not usually addressed

[b]Work at home was described in the questionnaire as home office work

[c]Household tasks were described in the questionnaire as laundry, cleaning

Note. Sample includes care providers who stated they would restrict activity in Scenario 3. It does not include those care providers (47 obstetricians, 47 family physicians and 60 midwives who indicated that they never recommended bed rest in hospital or at home.

Scenario 1

> A woman with a previous preterm birth at 31 weeks gestation is having a routine prenatal visit at 28 weeks. There have been no pregnancy complications. There have been occasional contractions but no other symptoms. She works in an office that she feels is a moderately stressful environment. She has a stable family environment and good support. A follow-up appointment and an ultrasound are scheduled.

Figures 2 to 4 show the percentages, of each care provider group that recommend bed rest in some situations, who would ask a woman to reduce or stop specific activities in Scenario 1. Between 65 and 70 percent of the 69 obstetricians, 111 family physicians and 60 midwives indicated this woman should reduce household tasks (defined on the questionnaire as laundry and cleaning), and 69 to 73 percent indicated they would recommend she reduce her childcare responsibilities. In regards to activity that should be stopped, 32 of 69 (46.4%) obstetricians, 59 of 111 (53.2%) family physicians and 25 of the 60 (41.6) midwives thought this woman should stop sexual activity. An average of 37.4 percent of all care providers also recommended that this woman stop activities that require prolonged standing.

Respondents indicated topics that they did not usually address in their discussions with women. The three topics most often **NOT** included in this clinical scenario were:

a) driving the car (21 of 69 [30.4%] obstetricians and 46 of 111 [41.4%] family physicians);

b) meal preparation (17 of 69 [24.6%] obstetricians, 33 of 11 [29.7%] family physicians, and 5 of 60 [8.3%] midwives);

c) work at home (15 of 69 [21.7%] obstetricians, 21 of 111 [17.1] family physicians).

A mean of 13 percent of obstetricians, 13.5 percent of family physicians and 25.4 percent of midwives did not answer the question about whether they would ask a woman to stop or reduce the specific activities in Scenario 1.

Figure 2 - Scenario 1 - Obstetrician Recommendations

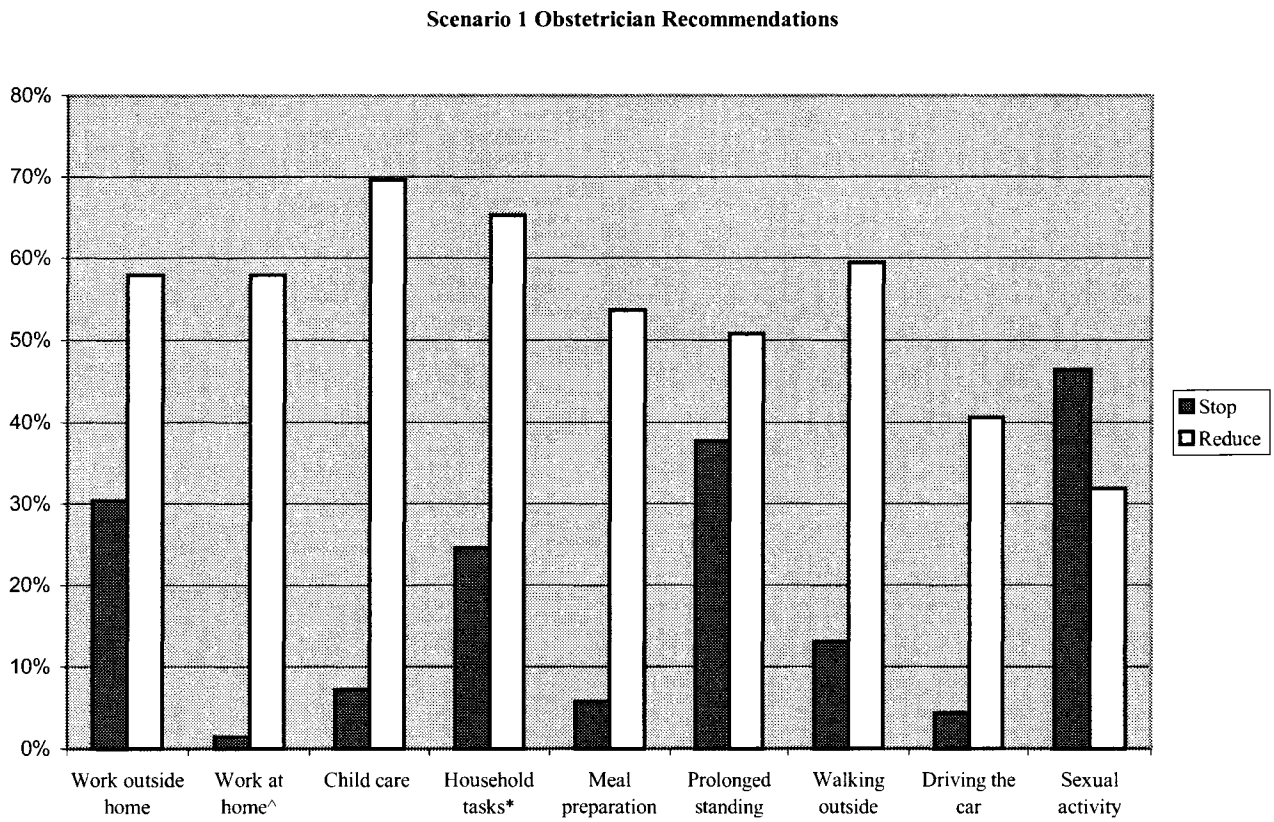


Figure 3 - Scenario 1 – Family Physician Recommendations

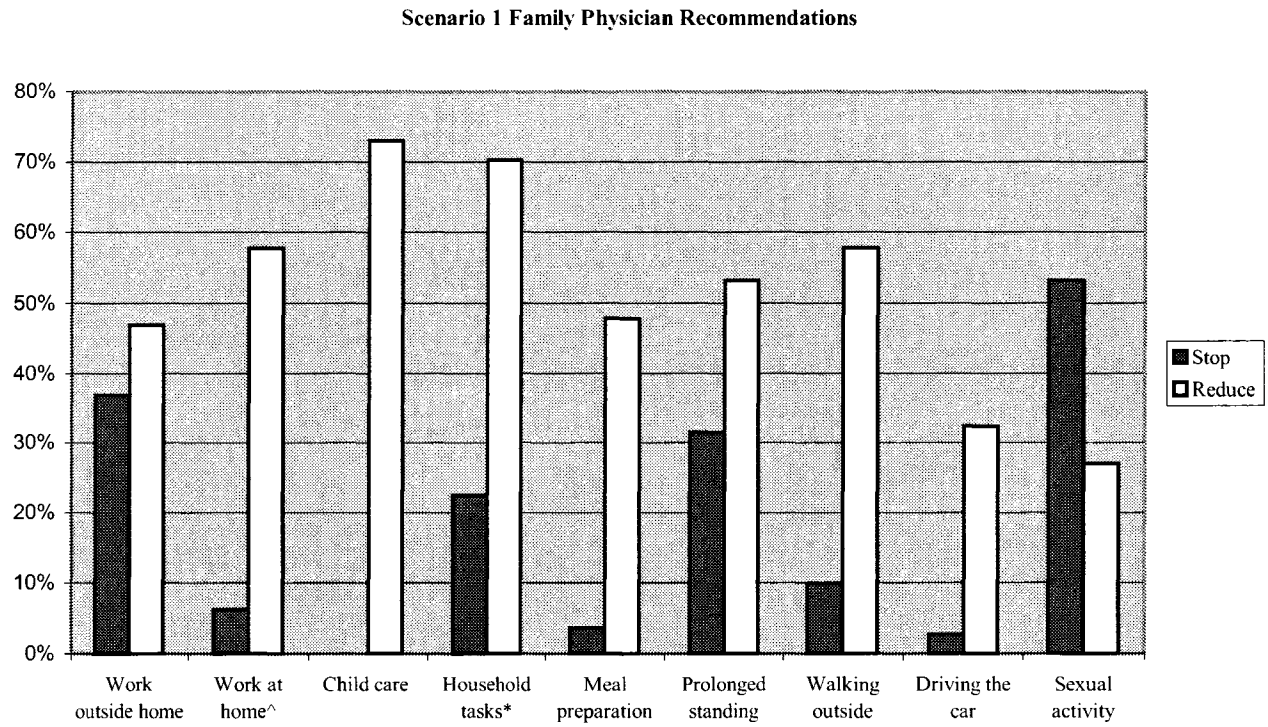
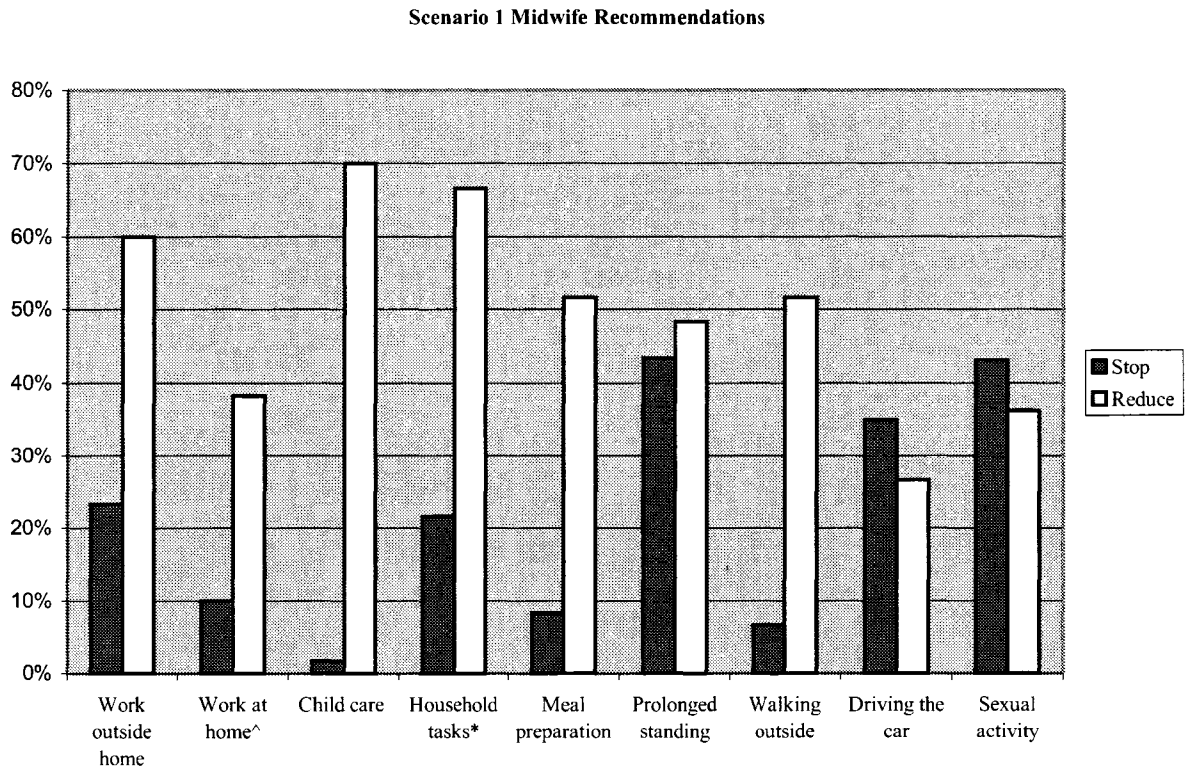


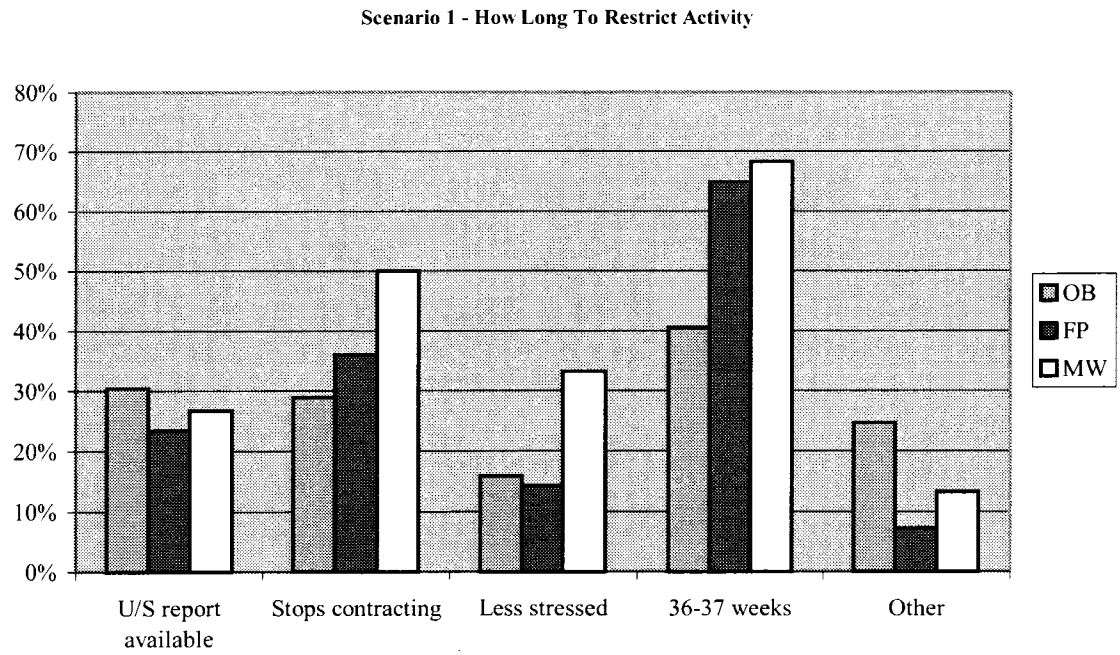
Figure 4 – Scenario 1 – Midwife Recommendations



In regards to specific advice that these care providers would give to this woman about rest, 55 of 69 (79.7%) obstetricians, 84 of 111 (75.7 %) family physicians and 33 of 60 (55%) midwives would recommend that she rest in bed or on the couch for one-to-two hours, 2 to 3 times daily. In the comments section for this question, 4 (6.6%) obstetricians, 12 (10.8%) family physicians and 2 (3.3%) midwives commented that they would recommend that the woman avoid or reduce activities that caused contractions as opposed to giving a certain prescription for rest.

When asked how long to continue the activity restriction in Scenario 1 (Figure 5), respondents could choose from a pick-list or indicate other. The choice with the highest percentage agreement for each of the three groups was "until 36 to 37 weeks": 28 of 69 (40.6 %) obstetricians, 72 of 111 (64.9%) family physicians and 41 of 60 (68.3%) midwives chose this option. In the "other" section, 12 (17.4%) obstetricians, 4 (3.6%) family physicians and 2 (3.3%) midwives indicated they would ask her to restrict activity until she was 34 weeks gestation or greater.

Figure 5 – Scenario 1 - How Long to Restrict Activity



Scenario 2

> A woman is pregnant for the first time with twins. She is 26 weeks gestation and has been admitted to the hospital with contractions. Cervical length has shortened from 25 mm to 10 mm. Fetal growth and biophysical parameters are normal. If everything stays stable for a few days, she will be discharged home. She asks what you would recommend in terms of activity at home.

There was more agreement on activity restriction in Scenario 2. The only care provider not recommending activity restriction for this woman was one obstetrician; 7 family physicians and 9 midwives indicated that they always refer these women to specialists (Table 6).

The percentages of each care provider group who would ask a woman to reduce or stop specific activities in Scenario 2 are presented in Figures 6 through 8. One-

hundred-and nineteen of 123 (96.7%) obstetricians, 142 of 152 (93.4%) family physicians, and 57 of 71 (80.3%) midwives indicated this woman should stop working outside the home. Large numbers of respondents also indicated that they would ask this woman to stop sexual activity: 105 of 123 (85.4%) obstetricians, 128 of 152 (84.2%) family physicians, and 51 of 71 (71.8%) midwives. For almost all the activities, obstetricians were more likely than family physicians to recommend that women stop them. In turn, family physicians were more likely than midwives to recommend that women cease these activities. The only exception to this was prolonged standing, where 75 percent of family physicians indicated they would ask a woman to stop this activity as compared to 74 percent of obstetricians and 63.4 percent of midwives. In most cases, midwives were more likely than family physicians and obstetricians to recommend reducing activities versus stopping them.

Figure 6 - Scenario 2 - Obstetrician Recommendations

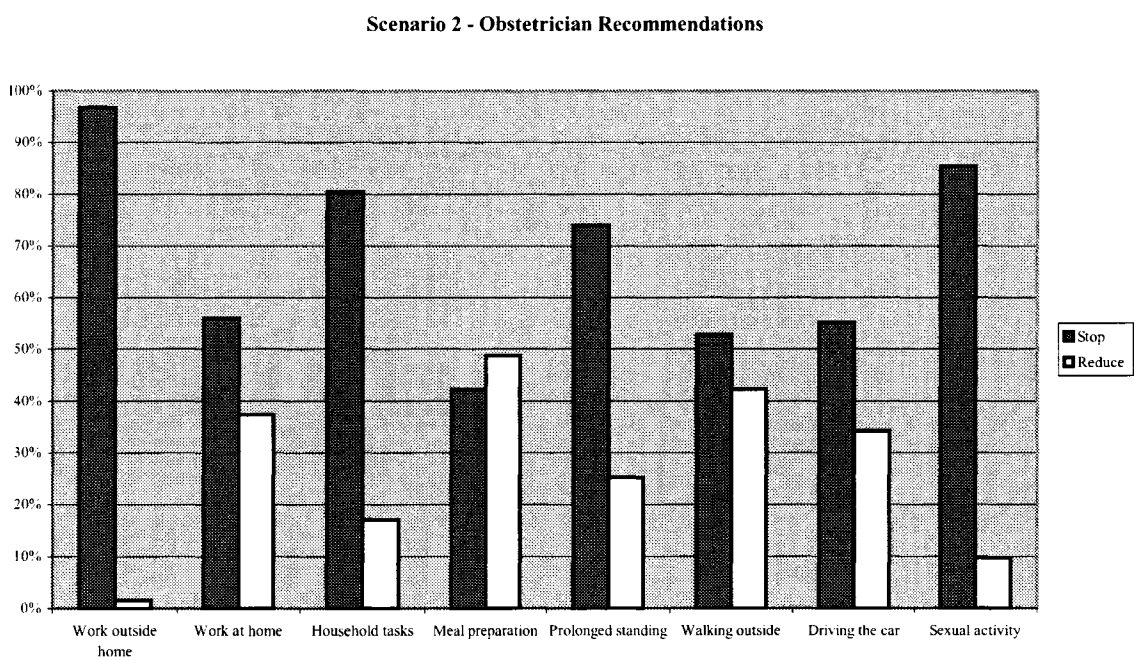


Figure 7 - Scenario 2 – Family Physician Recommendations

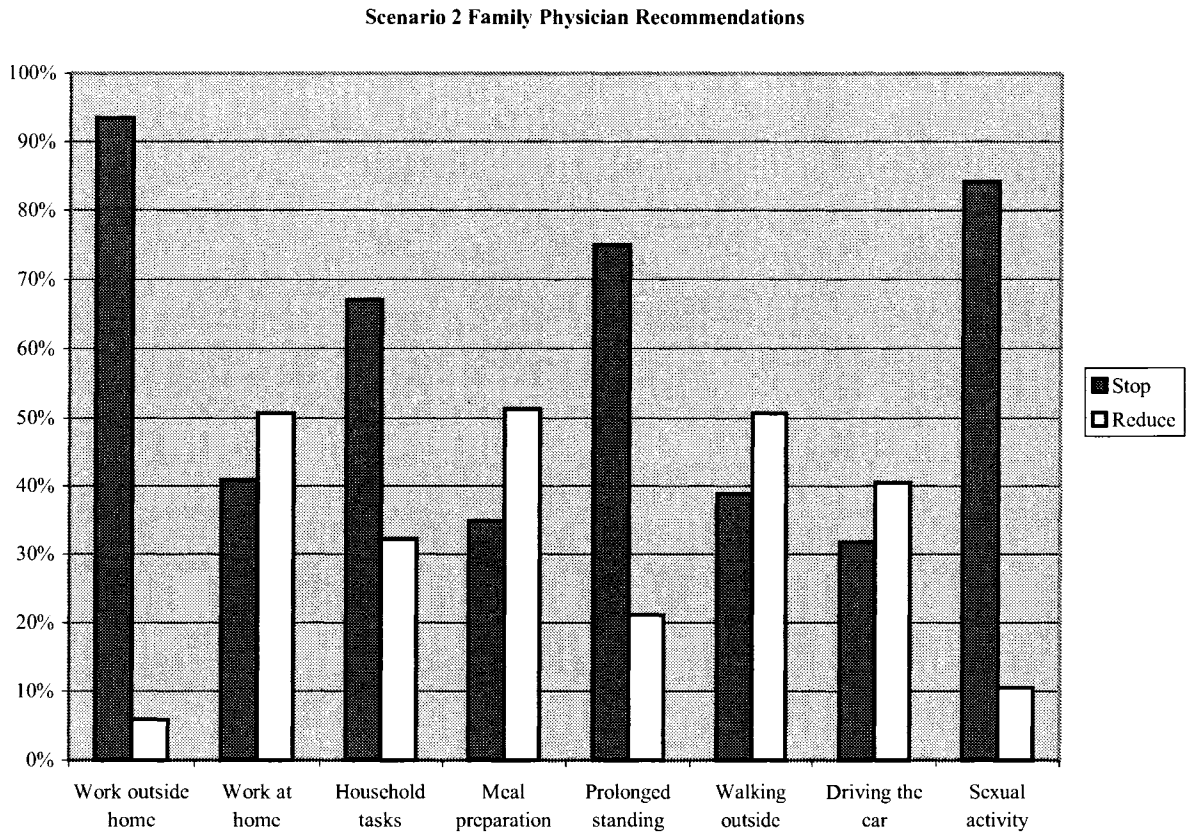
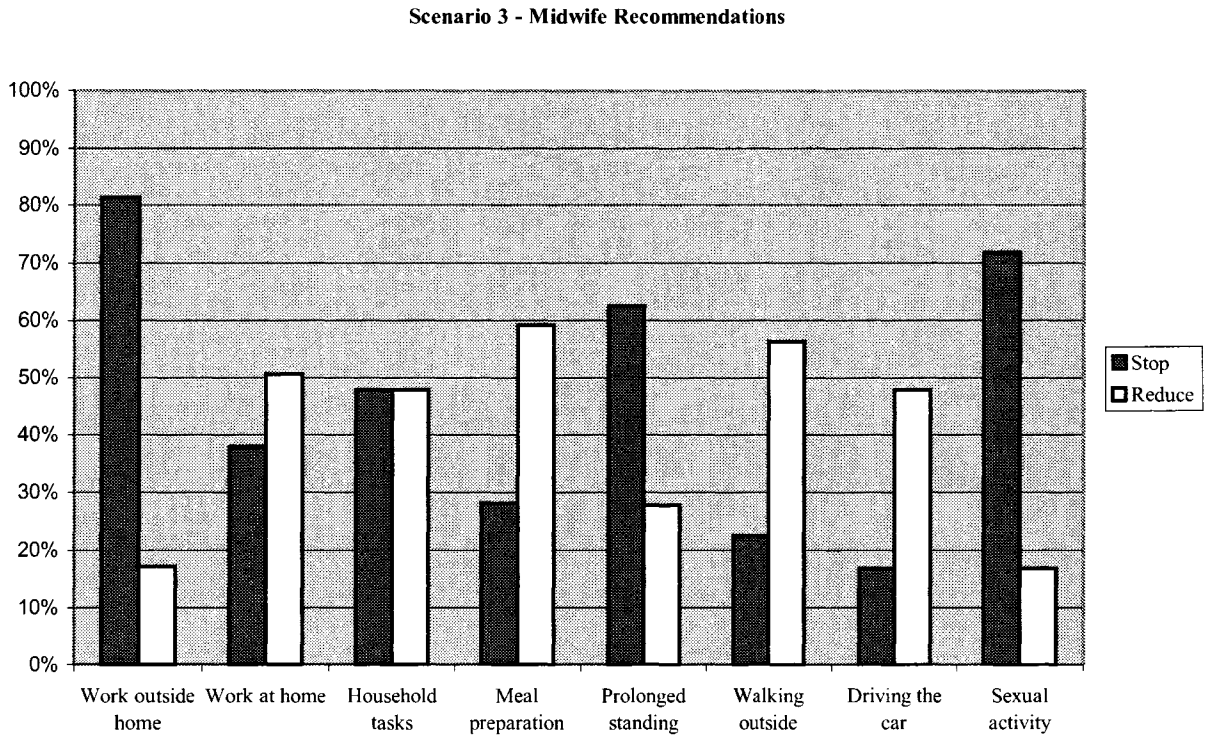


Figure 8 - Scenario 2 – Midwife Recommendations



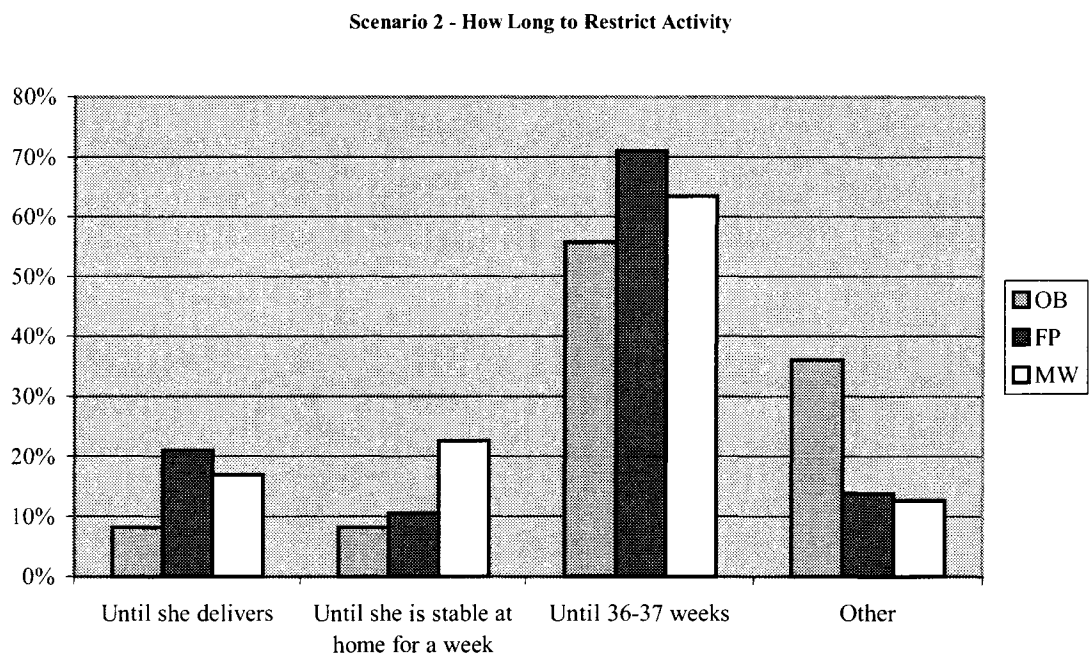
In all care provider groups there were less missing data for Scenario 2 than for Scenario 1. As well, within the physician groups, they were less likely to indicate that these activities were not usually addressed as part of the discussion with women in this situation as compared to Scenario 1. In the midwifery group, the same was mostly true except for giving information on driving the car, sexual activity, and prolonged standing, where a higher percentage of "not usually addressed" was found in Scenario 2 as compared to Scenario 1.

In regards to specific advice for rest that care providers would give a woman in a Scenario 2 situation, 75 of 123 (60.9%) obstetricians, 80 of 152 (52.5%) family physicians and 24 of 71 (33.8%) midwives would recommend the woman rest the majority of time on her couch/bed, except for going to the bathroom. A recommendation for resting one-to-two hours on the couch/bed, two-to-three times daily was made by 37 of 123 (30%) obstetricians, 61 of 152 (40.1%) family physicians and 39 of 71 (54.9%) midwives. One obstetrician, 3 family physicians and 1 midwife would recommend strict bed rest, where the woman could not even get up to the bathroom. In the comments section, small numbers of care providers (8 obstetricians, 5 family physicians, and 6 midwives) reported other specific activity restrictions or formulas of activity restriction that they usually recommend.

When asked how long they would continue to recommend or prescribe the activity restriction in Scenario 2 (Figure 9), respondents could choose from a pick-list or indicate "other". Similar to Scenario 1, the highest percentage of care providers in each of the three groups reported that they would recommend activity restriction "until 36 to 37 weeks": 68 of 123 (55.3%) obstetricians, 108 of 152 (71.1%) family physicians and

45 of 71 (63.4%) midwives. Also similar to responses in Scenario 1, the "other" category contained a variety of different gestational ages that respondents would see as an appropriate time for a woman to restrict her activity. The most popular of these was 34 weeks recommended by 22 (17.9%) obstetricians, 6 (3.9%) family physicians and 1 (1.4%) midwife.

Figure 9 –Scenario 2 - How Long to Restrict Activity



Scenario 3

> A primigravid woman at 30 weeks gestation reports regular tightenings and back pain for the last couple of days. During the office visit you can palpate contractions. When you send her for ultrasound, the cervical length is normal.

Similar to Scenario 1, those in the care provider groups who reported that they would recommend bed rest under some circumstances are divided about the

recommendations for this woman. Sixty-one of 123 (49.6%) obstetricians, 109 of 159 (68.6%) family physicians, and 46 of 80 (57.5%) midwives would recommend activity restriction. Figures 9 to 11 show the percentages of each care provider group who would ask the woman in Scenario 3 to reduce or stop the specific activities. Across the care provider groups there were higher percentages of people recommending a reduction of specific activities versus stopping them. There were two exceptions; these were sexual activity and work outside the home. For sexual activity, higher numbers of both obstetricians and family physicians would recommend stopping sexual activity versus reducing it (25 of 63 [39.7%] obstetricians would stop versus 23 of 63 [36.5%] who would reduce, and 63 of 111 [56.8%] family physicians would stop versus 33 of 111 [29.7%] who would ask them to reduce their activity. In the work outside the home category, 57 of 111 (51.4%) family physicians recommended stopping work versus 48 of 111 (43.2%) who recommended reducing time at work.

Figure 10 – Scenario 3 Obstetrician Recommendations

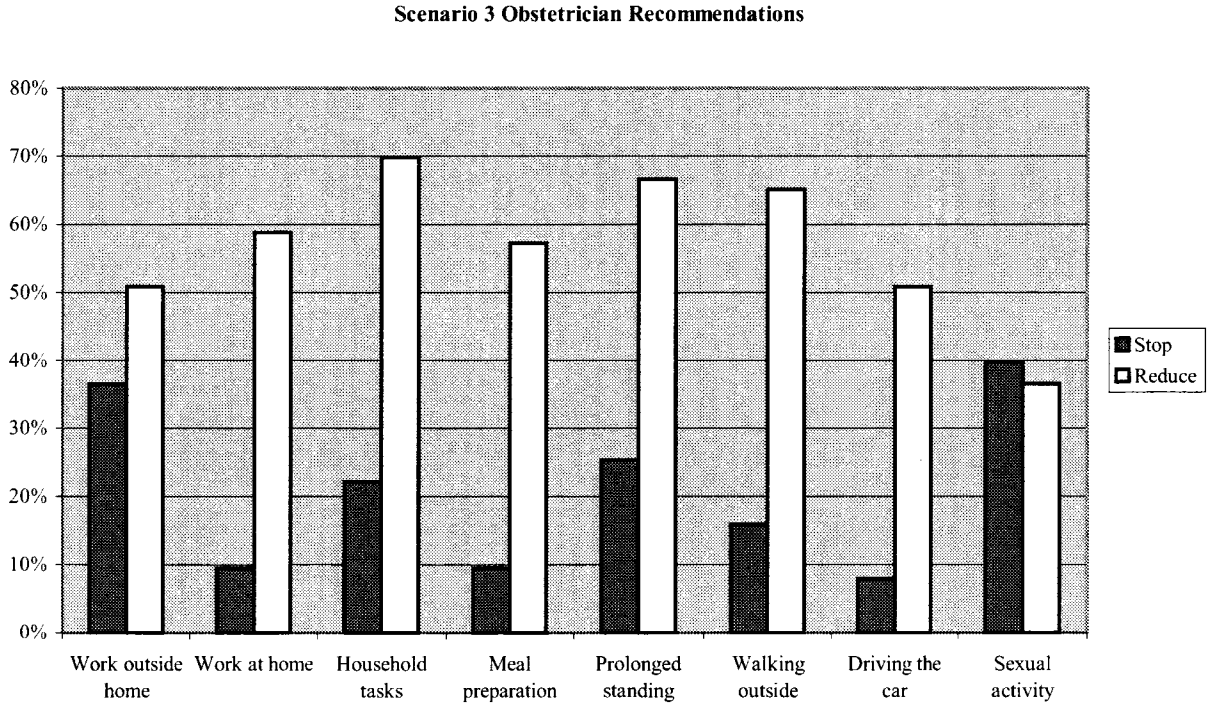


Figure 11 – Scenario 3 – Family Physician Recommendations

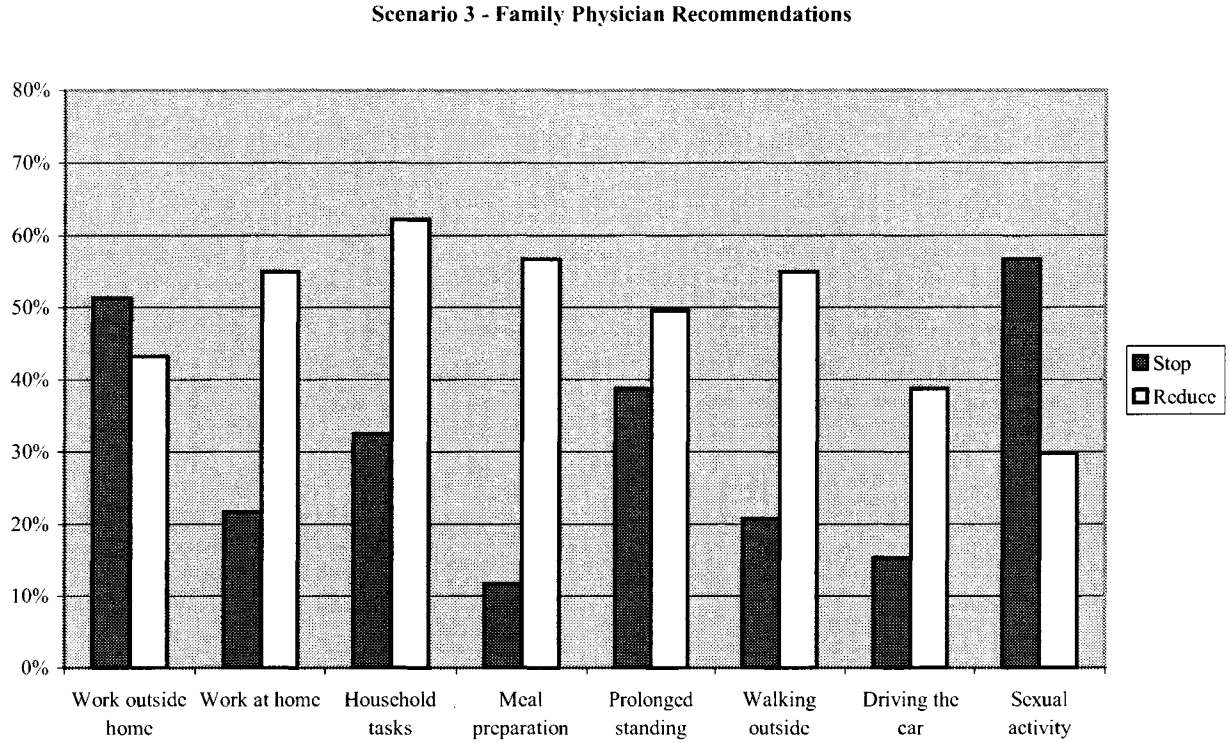
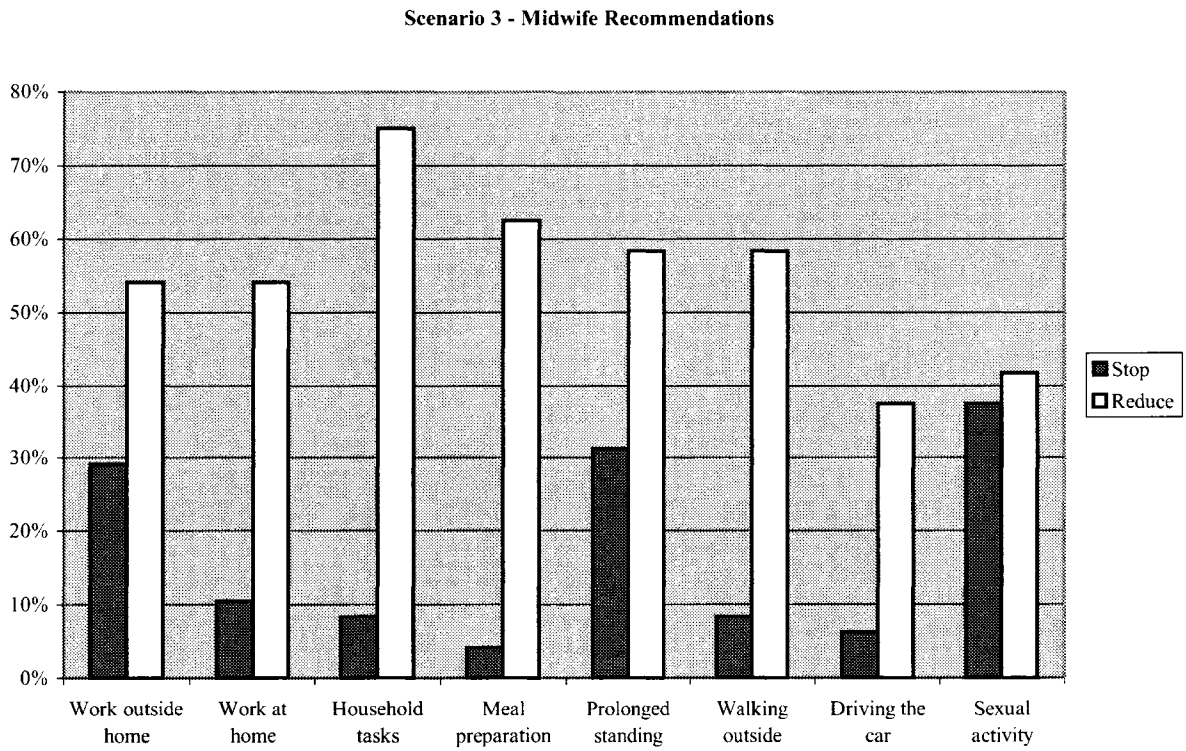


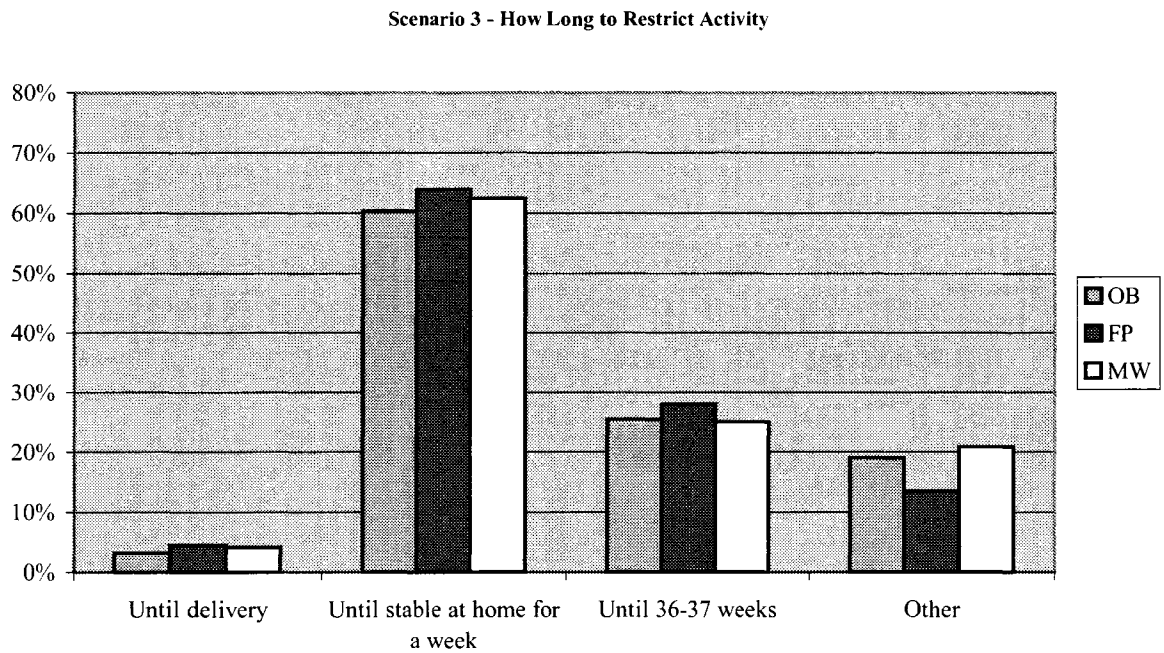
Figure 12– Scenario 3 – Midwife Recommendations



In regards to specific advice for rest that care providers would give in this situation, 50 of 63 (79.3) obstetricians, 71 of 111 (63.9%) family physicians and 34 of 48 (70.8%) midwives would recommend that the woman spend one-to-two hours on the couch or bed, two-to-three times per day. Five of 63 (8%) obstetricians, 15 of 111 (13.5%) family physicians and 3 of 48 (6.3%) midwives would recommend that the woman rest most of the time.

When asked how long to continue activity restriction in Scenario 3 (Figure 12), respondents could choose from a pick-list or indicate "other". The highest percentage among all three groups suggested that activity be restricted until the woman was stable at home for a week. This included 38 of 63 (60.3%) obstetricians, 71 of 111 (64%) family physicians and 30 of 48 (62.5%) midwives. Similar to the other two scenarios, the "other" category contained comments on other gestational ages, and in this case 3 obstetricians, 4 family physicians and 4 midwives indicated they would rely on further assessment before making this decision.

Figure 13 – Scenario 3 – How Long to Restrict Activity



Question 3 – What concerns do obstetricians, family physicians and midwives have about the side effects of bed rest?

A summary of the concerns of respondents about a list of potential side effects associated with bed rest is presented in Table 10. Respondents were asked to rate their concern on a scale of 1 (not at all concerned) to 5 (extremely concerned). The categories were collapsed for analysis to include: not at all to somewhat concerned; concerned; and, very to extremely concerned. The top five areas of concern for all care provider groups were deep vein thrombosis, stress, depression, sleep disturbances and economic problems (Table 11).

Care providers were asked whether they routinely recommend any sort of exercise program or social support for women to whom they recommended any degree of bed rest. Seventy-six of 123 (61%) obstetricians, 114 of 159 (71.7%) family physicians and 39 of 80 (48.8%) midwives do not routinely recommend any sort of exercise program. For the 47 of 123 (38.2%) obstetricians, 45 of 159 (28.3%) family physicians and 39 of 80 (48.8%) midwives who do, 12 (9.7%) obstetricians, 1 family doctor, and 3 (3.7%) midwives recommend physiotherapy, and 16 (13%) obstetricians, 16 (10%) family physicians and 9 (11.2%) midwives recommend specific leg exercises. Three (2.4%) obstetricians, 15 (9.4%) family physicians and 31 (38.7%) midwives also provided other recommendations for specific types of exercises.

In regards to social support for women on any degree of bed rest, 67 of 123 (54.5%) obstetricians, 63 of 159 (39.6%) family physicians and 19 of 80 (23.5%) midwives do not routinely recommend any sort of social support. Of the 56 of 123

(45.5%) obstetricians, 95 of 159 (59.7) family physicians and 58 of 90 (64.4%) midwives who do, 15 (4%) obstetricians, 41 (25.8%) family physicians and 21 (26.2%) midwives indicated that they would recommend that the spouse or family or relatives take on this role. There were also other suggestions that friends or work colleagues provide social support. A small number of care providers suggested that other health care providers such as social workers, or home care nurses, fulfill this role.

Table 10 – Concerns about the Potential Side Effects Associated with Bed Rest

Side Effect	% Not at all/Somewhat concerned			% Concerned			% Very/Extremely Concerned			% Not Aware of this Side Effect		
	OB (n=123)	FP (n=159)	MW (n= 80)	OB (n=123)	FP (n=159)	MW (n= 80)	OB (n=123)	FP (n=159)	MW (n= 80)	OB (n=123)	FP (n=159)	MW (n= 80)
Muscle atrophy	61.8	62.3	53.8	26.0	27.0	27.5	12.1	10.1	10.0	0.0	0.6	6.3
Change in Bone Mass	73.9	76.7	60.1	17.0	14.5	13.8	8.2	6.3	7.6	0.0	1.9	15.0
Cardiovascular deconditioning	66.7	68.6	47.6	22.8	20.8	23.8	9.8	10.1	15.1	0.0	0.6	10.0
Fatigue	64.3	61.7	42.5	26.8	30.2	30.0	8.9	6.3	16.3	0.0	1.9	7.5
Weight Loss	72.4	74.8	57.6	21.1	17.6	17.5	3.2	3.7	8.8	1.6	3.8	10.0
Deep vein thrombosis	13.8	17.7	16.3	25.2	32.1	27.5	60.2	49.7	48.8	0.8	0.0	3.8
Stress	29.3	25.8	18.6	38.2	29.6	18.7	32.5	42.7	58.8	0.0	1.3	0.0
Depression	26.1	25.7	15.0	41.5	29.6	21.3	32.6	44.1	62.6	0.0	0.6	0.0
Sleep disturbances	39.0	41.5	27.6	39.0	30.2	35.0	21.2	25.2	37.5	0.0	3.1	0.0
Economic problems	25.2	25.1	12.5	46.3	33.3	35.0	27.7	40.9	47.5	0.0	0.6	1.3

Note. Sample includes only those care providers who use bed rest as a therapy. It does not include those care providers (47 obstetricians, 47 family physicians and 60 midwives who indicated that they never recommended bed rest in hospital or at home.

Table 11 – Rankings of Concerns about Bed Rest

	% With Any Concern About Side Effects					
	OB (n=123)		FP (n=159)		MW (n= 80)	
Side Effect		Rank		Rank		Rank
Muscle atrophy	38.1	6	37.1	6	37.5	8
Change in Bone Mass	25.2	9	20.8	9	21.4	10
Cardiovascular deconditioning	32.6	8	30.9	8	38.9	7
Fatigue	35.7	7	36.5	7	46.3	6
Weight Loss	24.3	10	21.3	10	26.3	9
Deep vein thrombosis	85.4	1	81.8	1	76.3	4
Stress	70.7	4	72.3	4	77.5	3
Depression	74.1	2	73.7	3	83.9	1
Sleep disturbances	60.2	5	55.4	5	72.5	5
Economic problems	74.0	3	74.2	2	82.5	2

Note. Sample includes only those care providers who use bed rest as a therapy. It does not include those care providers (47 obstetricians, 47 family physicians and 60 midwives who indicated that they never recommended bed rest in hospital or at home.

Question 4 – What are obstetricians', family physicians' and midwives' perceptions of women's compliance with their recommendations for therapeutic rest?

Respondents were asked to indicate how often (not at all, sometimes, most of the time, all of the time) they thought that women at risk for preterm birth followed their recommendations for bed rest or activity restriction (Table 12). Between 65 and

75 percent of all care provider groups indicated that they thought women followed their recommendations for reduced activity, most of the time. No one indicated that women would not follow this recommendation. However, in relation to the recommendation for strict bed rest including not getting up to the bathroom, 40 to 50 percent of care providers indicated that they believed women would "not at all" follow this plan of care. For modified bed rest, 69 of 123 (56%) obstetricians, 85 of 159 (53.4%) family physicians and 39 of 80 (48.7%) midwives, thought that women followed their recommendations most of the time.

Table 12 – How Often Respondents Think Women Follow Recommendations for Bed Rest or Activity Restriction

Level of Activity	Not At All						Sometimes						Most of the Time						All of the Time					
	OB (n=123)		FP (n=159)		MW (n=80)		OB (n=123)		FP (n=159)		MW (n=80)		OB (n=123)		FP (n=159)		MW (n=80)		OB (n=123)		FP (n=159)		MW (n=80)	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Strict bed rest[a]	50	(40.6)	81	(50.9)	38	(47.5)	44	(35.7)	44	(27.6)	15	(18.7)	20	(16.2)	20	(12.5)	13	(16.2)	3	(2.4)	1	(0.6)	3	(3.7)
Modified bed rest	5	(4.0)	2	(1.2)	1	(1.2)	37	(30.0)	69	(43.3)	30	(37.5)	69	(56.0)	85	(53.4)	39	(48.7)	10	(8.1)	1	(0.6)	4	(5.0)
Reduced activity	0	---	0	---	0	---	20	(16.2)	28	(17.6)	4	(5.0)	80	(65.0)	111	(69.8)	60	(75.0)	23	(18.7)	20	(12.6)	15	(18.7)

[a] the difference between strict bed rest and modified bed rest was defined by whether the woman could get up to use the bathroom

Question 5 – Do obstetricians, family physicians and midwives have any degree of decisional conflict when recommending bed rest for women at risk of preterm birth?

Two survey questions dealt with the decision making process of recommending bed rest for women at risk of preterm birth. On the first (Question 4), respondents were asked to indicate on a five-point scale, (1 being not at all important to 5 being extremely important), the weight they placed on a number of variables that might affect their decision to recommend bed rest. When the categories were collapsed (Table 13), the highest rated consideration for obstetricians and family physicians before recommending bed rest was the number of other children at home [64 of 123 (52%) obstetricians and 88 of 160 (55%) family physicians]. For midwives, it was whether the woman had help at home [54 of 80 (67.5%)]. Fifty to 53 percent of each group were also concerned about the woman's likelihood of compliance. In regards to what was "not at all important" to respondents, 24 of 123 (19.5%) obstetricians, 35 of 160 family physician (21.9%) and 10 of 80 (12.5%) indicated it was whether the woman could afford to be away from work.

Table 13 - Considerations Before Recommending Bed Rest

Considerations Before Recommending Bed Rest	Not At All Important						Somewhat Important/Important						Very Important/Extremely Important					
	OB (n=123)		FP (n=160)		MW (n=80)		OB (n=123)		FP (n=160)		MW (n=80)		OB (n=123)		FP (n=160)		MW (n=80)	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Whether she can afford to be away from work	24	(19.5)	35	(21.9)	10	(12.5)	77	(62.6)	77	(61.8)	46	(57.5)	19	(15.4)	26	(16.2)	23	(28.7)
Whether she has help at home	7	(5.7)	8	(5.0)	1	(1.3)	58	(47.1)	76	(47.5)	24	(30.0)	55	(44.7)	75	(46.9)	54	(67.5)
Number of other children at home	7	(5.7)	6	(3.8)	3	(3.8)	49	(39.9)	66	(41.3)	28	(35.0)	64	(52.0)	88	(55.0)	48	(60.0)
Likelihood of compliance	8	(6.5)	7	(4.4)	7	(8.8)	49	(39.8)	70	(43.8)	29	(36.3)	62	(50.4)	82	(51.3)	43	(53.8)
Side effects of bed rest	11	(8.9)	17	(10.6)	4	(5.0)	76	(61.7)	100	(62.5)	42	(52.6)	33	(26.8)	43	(26.9)	32	(40.0)
Social support network	5	(4.1)	6	(3.8)	2	(2.5)	59	(48.0)	81	(50.6)	28	(35.0)	56	(45.5)	73	(45.6)	48	(60.0)

The second question related to decision making concerned decisional conflict. Respondents were asked to consider the last woman at risk of preterm birth to whom they had recommended bed rest, and then complete the twelve statements of Dolan's (1999) *Provider Decision Process Assessment Instrument (PDPAI)* (Question 9). All items were answered on a five-point Likert-type scale and responses ranged from strongly agree (1) to strongly disagree (5). A summary score was calculated by adding the responses of the individual items after reversing the scoring for items 1, 2, 4, 5, and 6 to make the direction of all responses consistent. The minimum score is 12 and the maximum is 60. Higher scores indicate higher levels of decisional conflict.

Six of 123 (4.9%) obstetricians, 17 of 159 (10.7%) family physicians and 15 of 80 (18.7%) midwives left out one or more items on the scale. Out of a possible total of 4308 items 185 (4.3%) were missing. Data imputation was initially performed to reduce bias associated with incomplete data, but because of the small amount of missing data and the fact that data imputation led to some significant findings that were not present before imputation and could not be considered to be clinically important, a decision was made to return to analysis without imputation.

Scores on the *PDPAI* were normally distributed. The mean score on this questionnaire for all care provider groups was 30 (SD 7.4) out of a possible score of 60. When broken down by group, mean scores were available for 118 obstetricians [29.5 (SD 6.6)], 156 family physicians [30.9 (SD 7.9)], and 76 midwives [28.9 (SD 7.5)]. When dividing these scores by 12 to convert them to the same scoring used on O'Connor's *Decisional Conflict Scale* for patients (1999), as suggested by Légaré et al. (2003c), the mean score for all care provider groups was 2.5. When broken down by

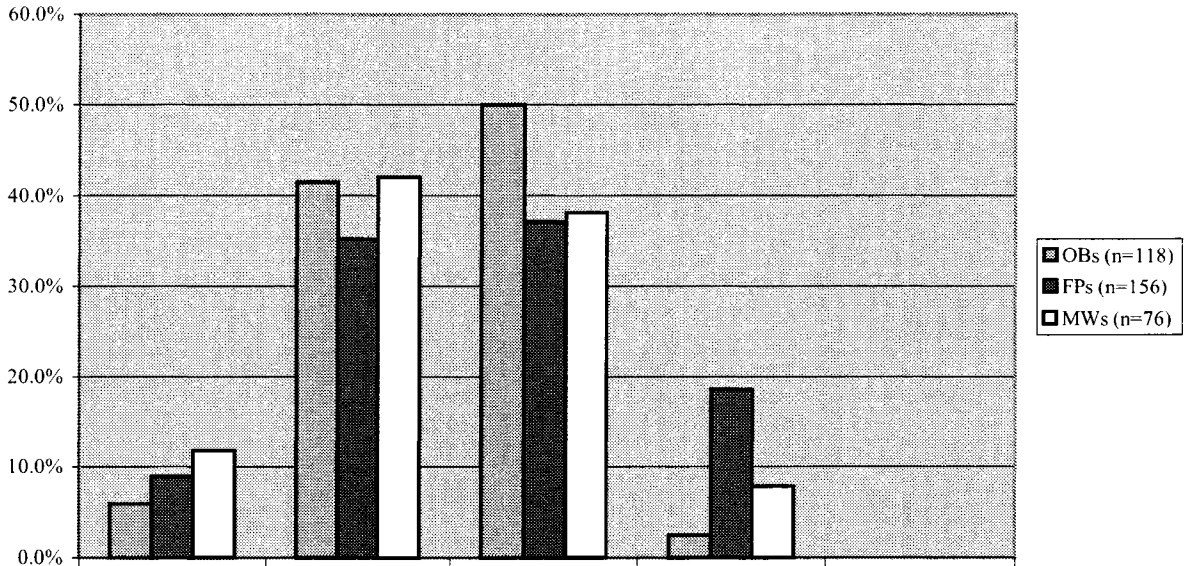
group, the mean score for the 118 obstetricians was 2.5 (SD 0.55), for the 156 family physicians was 2.6 (SD 0.66), and for the 76 midwives was 2.4 (SD 0.63). Using analysis of variance, there was no significant differences in mean scores between the groups ($F [2,347] = 2.24$, $p=0.11$).

The breakdown of scores by group for the *PDPAI* is presented in Table 14 and Figure 14. While no group had scores of 50 or greater, 29 of 156 (18.6%) of family physicians scored between 40 and 49 as compared to 3 of 118 (2.5%) obstetricians and 6 of 76 (7.9%) midwives. The mean scores for each item of the scale are presented in Table 15. For physicians, the highest score was on item "e" which described the decision being difficult due to a lack of important information in the literature. For midwives, their highest score was on item "b", which described uncertainty of knowing whether bed rest was best for the woman.

Table 14 - *PDPAI* Scores by Discipline

***PDPAI* Score**	**Obstetricians (n=118)**	**Family Physicians (n=156)**	**Midwives (n= 76)**
	n (%)	n (%)	n (%)
12-19	7 (5.9)	14 (9)	9 (11.8)
20-29	49 (41.5)	55 (35.3)	32 (42.1)
30-39	59 (50.0)	58 (37.2)	29 (38.2)
40-49	3 (2.5)	29 (18.6)	6 (7.9)
>50	0	0	0
Mean Score	29.5	30.9	28.9

Figure 14 – PDPAI Score Ranges by Discipline



	12 to 20	21 to 30	31 to 40	40 to 49	> 50
OBs (n=118)	5.9%	41.5%	50.0%	2.5%	0.0%
FPs (n=156)	9.0%	35.3%	37.2%	18.6%	0.0%
MWs (n=76)	11.8%	42.1%	38.2%	7.9%	0.0%

Table 15 – Mean Scores for Each Item on the *PDPAI*

Item	Mean Score - *PDPAI* Items OBs (n=118)	FPs (n=156)	MWs (n=76)
a The decision to recommend bed rest was hard to make.	2.55	2.84	2.82
b I was unsure whether bed rest would really be best for this woman.	2.94	2.91	2.97
c It was clear that bed rest would be best for this woman.	2.81	2.65	2.84
d When making the decision, I felt I did not know enough about treatment alternatives, although the information is available in the literature.	2.25	2.54	2.23
e I had trouble making the decision because important information on bed rest is either unknown or not readily available in the literature.	3.08	3.13	2.61
f When I made the decision, it was hard to decide if the benefits of bed rest/activity restriction were more important that the risks or vice versa.	2.86	3.01	2.73
g It was easy to identify all the considerations that affect the decision to recommend bed rest/activity restriction.	2.73	3.03	2.76
h I fully understood the patient's views regarding the important issues in making this decision.	2.16	2.21	2.08
i I believed that the patient fully understood the risks and benefits of bed rest/activity restriction that I recommended.	2.14	2.48	2.2
j I believed that the patient would comply with the bed rest/activity restriction regimen I recommended.	2.17	2.39	2.35
k I was satisfied with the decision that was made.	1.96	2.13	2.08
l I was satisfied that the process used to make the decision for bed rest/activity restriction was as good as it could be.	2.11	2.42	2.23

Other Questions

To complete the questionnaire, respondents were asked some general questions regarding practice and their interest in participating in research conducted in the area of bed rest for preterm birth. One of the newer areas of research that has the potential to help clinical decision making about whether or not a woman is at risk of early delivery is fetal fibronectin testing. All survey respondents were asked if their hospital uses this test to help determine whether to admit a woman with suspected preterm labour. Fifty-one of 170 (30%) obstetricians, 58 of 206 (28.2 %) family physicians and 43 of 140 (30.7%) midwives reported that this test was available in their setting. Fifty-two of 206 (25%) family physicians and 28 of 140 (20%) midwives did not know if this was available in their setting.

Respondents were asked to indicate if they would encourage their patients to participate in different types of research about the use of bed rest in pregnancy. They could check off various choices or add comments about types of research. The most popular choice was a randomized controlled trial to demonstrate the usefulness of bed rest. One-hundred-and-thirty-four of 170 (78.8%) obstetricians, 138 of 206 (67 %) family physicians and 91 of 140 (65%) midwives chose this option. Fifty-eight to 66 percent of the care providers would encourage women to participate in research about the physiological side effects of bed rest and 60 to 73 percent would encourage participation in research about the psychosocial effects. Less than 50 percent of all groups would encourage women to participate in research where the effects of maternal bed rest on the newborn were studied.

Chapter 5

DISCUSSION

The purpose of this study was to explore the practices of obstetricians, family physicians and midwives around the use of bed rest as a therapy for women at risk for preterm birth. Because bed rest as a recommendation or therapy is not often an all-or-nothing phenomenon, various degrees of activity restriction associated with bed rest were also explored.

Few studies in the literature explore the use of bed rest and/or activity restriction by three primary care provider groups who could potentially be involved in maternity care. It is important to consider all possible provider groups when assessing bed rest and activity restriction because, although a woman who is investigated for preterm labour and possible preterm birth is likely to be eventually under the care of an obstetrician, all three groups of care providers could potentially be caring for her if she is at risk of preterm birth due to various physiological or psychosocial risk factors early in pregnancy. They also could provide care before the more obvious signs and symptoms of preterm labour occur, including the early stages of preterm labour. The one previous published survey that investigated recommendations for bed rest involved directors of maternal-fetal medicine programs in the United States (n=44) and a random selection of obstetricians (n=47) (Maloni et al., 1998). The sample in this survey is more representative of the range of Canadian healthcare providers who could potentially be caring for women at risk of preterm birth, or in preterm labour.

Obstetricians, as well as family physicians and midwives from all geographic regions in Canada were recruited.

In summary, the findings of this study are that in Canada, many obstetricians, family physicians and midwives recommend bed rest and activity restriction to women despite the fact that nearly two-thirds of them believe bed rest is only *fair* to *poor* in helping to prevent preterm birth. Nearly half of the providers think the same about activity restriction. Other than in the scenario where a woman experienced a twin pregnancy and had a shortened cervix, there is not a great deal of consistency among the three health care provider groups when recommending bed rest. Recommendations about stopping or reducing specific types of activity also lacked consistency. Cervical changes as opposed to other signs and symptoms of preterm labour led to more recommendations for bed rest for women experiencing both singleton and multiple pregnancies across gestational ages.

When care providers recommended to women that they reduce their activity or go on bed rest, most did not routinely recommend any sort of rehabilitative exercise or preventative program for these women, despite the fact that deep vein thrombosis was the number one side effect that concerned obstetricians and family physicians, and among the top five that concerned midwives.

Just over half of all care providers believed that women followed their recommendations for modified bed rest 'most of the time' and about 70 percent of care providers indicated that they thought women followed their recommendations for reduced activity, 'most of the time'.

Respondents to the survey had some degree of decisional conflict about recommending bed rest for pregnant women at risk of preterm birth. A discussion of the study findings, limitations of the study, and implications for practice and research will be presented in this chapter.

Study Method

Use of Dillman's (2000) 5-point contact survey protocol likely improved the response rate to this mailed, self-administered survey. If only a 3-point contact strategy had been used, 350 to 400 completed surveys would have been received. After the fourth and fifth mailings, another 185 surveys were returned. A less costly alternative to this mailed survey would have been a web-based survey. Use of Internet surveys eliminates printing, postage and data entry costs as well as shortens the length of time needed to conduct surveys. Internet-based surveys also give researchers the possibility of dramatically increasing their sample size for relatively little cost (Dillman, 2000). There were two important reasons why an Internet survey was not selected for this study. If the survey were to be completely electronic, a reliable e-mail distribution list would be needed and such a list would not have been easily attainable. For example, the *Scotts MD Select* program did not have a complete list of electronic mail addresses for the physicians on their list. Therefore, the mailing lists would need to have been obtained either from the three national professional associations [i.e., Society of Obstetricians and Gynaecologists of Canada (SOGC); College of Family Physicians of Canada; and, the Canadian Association of Midwives (CAM)]. In at least one organization (SOGC), membership is dependent on fee payment and therefore the list

from which the sample could be selected would not have been as complete, thus risking coverage bias or error. Secondly, it would theoretically have been possible to mail a letter to care providers using the sampling process described for this survey and request that care providers go to a website and complete the survey. However, there is no data available about how many care providers have access to the Internet, especially from their offices where they received notice about the survey. In a recent Canadian survey of physicians about preconception care, where the choice of return was by mail or an Internet site, less than 5 percent of physicians chose to provide their feedback through the Internet (personal communication, Dr. Suzanne Tough, University of Calgary, February, 2006). For this survey, the Internet approach was deemed to be more risky than simply mailing the survey.

In a recent web-based survey for the Multidisciplinary Collaborative Primary Maternity Care Project (MCP^2), using much the same population of care providers, the e-mail distribution list obtained from the professional organizations was used. The family physician group would not release their e-mail distribution list and therefore the researchers relied on family physicians that were members of the SOGC or part of a family physician list-serve group for obstetrics. They distributed their electronic survey using a 4-point contact process to 3,977 obstetricians, family physicians, midwives, nurses and nurse practitioners. The overall response rate was 20 percent with a range of 6 to 40 percent for specific groups (personal communication, Dr. Barbara Davies, November 21, 2005). Unfortunately, the MCP^2 survey and the bed rest survey were distributed at about the same time and may have adversely affected each other's response rate.

Response Rate and Demographics

Of the total sample of 1437 care providers, 269 (18.7%) were no longer providing prenatal care. For some time it has been reported that the numbers of those providing a full scope of prenatal and intrapartum services has been declining. This phenomenon is believed to be creating an impending crisis for Canadian women and their families (Anderson, 2004; Levitt & Kaczorowski, 1999; Pellizarri & Medves, 2002). This decline was also noted in two other Canadian surveys of health care providers. In a survey of obstetricians about the topic of vaginal birth after caesarean, the investigators recruited their sample using the *Scotts MD Select* list; and 13.6 percent of their sample indicated they were no longer working in obstetrics (Brill et al., 2003). Pramod and associates (2004) recruited their sample from the SOGC membership list and 21.2 percent of care providers also indicated they no longer provided a full scope of maternity care. It is possible that some of these care providers only practised gynecology or were sub-specialists in fertility or oncology, but the disturbing trend of reduced numbers of care providers continues in 2005. As the remaining care providers become busier, finding time for non-clinical activities such as participating in research or education will become more difficult.

For the obstetricians, the response rate of 47.5 percent for participation in this study is very similar to that reported by Brill and colleagues (2003), for the Canadian survey on Vaginal Birth after Caesarean (VBAC) at term and Hutton, Hannah and Barrett's (2002) study on external cephalic version for breech; other clinical areas where difficult decisions are required. The midwifery group response of 52.4 percent was encouraging and also similar to the breech study. As midwives are generally

known to be extremely holistic in their care and as the practice of bed rest or activity restriction can be very disruptive to women and their families, it is perhaps not surprising that large numbers of midwives took the opportunity to provide feedback on this issue. However, the midwifery perspective is not as representative nationally as that of the physicians because there is no midwifery legislation in Atlantic Canada or Saskatchewan. The family physician group had the lowest response rate at 28 percent. This might be reflective of the varied nature of their practices. If obstetrics is only a small part of their overall practice, they may not have viewed this study as a priority.

Beliefs about Effectiveness of Bed Rest and Activity Restriction for Women at Risk of Preterm Birth and Use of Bed Rest by Care Providers

Care provider's perceptions of how often they saw women who were at risk of preterm birth was interesting. Respondents were asked to consider physiological as well as psychosocial risk factors in answering this question. Whereas almost three-quarters of obstetricians reported that they saw women whom they deemed to be "at risk" on a weekly basis, about one-quarter of family physicians and only 13 percent of midwives indicated they did. Possible explanations for this are either the increased volume of women who are seen in an obstetrician's practice or the philosophical underpinnings of the individual care provider group. Related to volume, obstetricians would be seeing women for antenatal care continuously, whereas depending on the amount of obstetrics for a family physician, time could elapse between obstetric patients. However, as midwives only deal with pregnant or postpartum women why are their perceptions of risk associated with preterm birth much lower than that of either

physician group? Perhaps it is related to the general differences in perception between midwives and many physicians about the pregnancy and birthing experience as a normal physiological process rather than as a "risky situation" with a high potential for problems (Klein, 2005; Reime et al., 2004).

Since the majority of preterm birth happens in populations who are perceived to be at low risk, a number of authors have discussed the need for health care providers to consider every woman potentially at risk of preterm birth and take a population-based approach to this issue instead of a risk-based approach (Heaman, Sprague & Stewart, 2001; Moutquin, Milot-Roy & Irion, 1996; Sprague et al., 2003; Stewart, 1998). This would mean that health care providers would provide appropriate counselling to every woman about the potential for preterm birth. To-date, it appears that this approach is not widely used in the community of care providers as over half of the midwives and a third of family physicians indicated that they saw women at risk for preterm birth only two-to-three times per year.

It was concluded in a Cochrane review (Sosa et al., 2003) that there is no evidence that bed rest in hospital or at home is beneficial as a therapy for prevention of preterm birth in women identified as high risk; it was also concluded that clinicians should not routinely recommend this practice due to the potential for adverse side effects. Similar recommendations have come from the *American College of Obstetricians and Gynecologists (ACOG)* (2003), Goldenberg (1994) and Allen and colleagues (1999). Although these recommendations are not based on evidence from randomized trials where harm associated with the practice is demonstrated, they are based on the fact that there is no evidence indicating benefit in conjunction with other

studies that have identified physiological and psychosocial side effects (Kovacevich et al., 2000; Maloni, 1993; Maloni et al., 2004a; Maloni, Brezinski-Tomasi &Johnson, 2001; Maloni et al., 1993; Maloni et al., 2002; Maloni & Kasper, 1993; Maloni & Park, 2005; Maloni, Park, Anthony &Musil, 2004b; Maloni & Ponder, 1997; Maloni & Schneider, 2002; May, 1994; May, 2001; Schroeder, 1996; Schroeder, 1998).

Perhaps though, the prevention of preterm birth with bed rest or activity restriction is not the most appropriate outcome for studies of bed rest or activity restriction. Obviously, the outcome for a baby at 26 weeks gestation is very different than 35 weeks gestation. Every day gained at the earlier gestational ages can make a difference in outcome; from 24 to 28 weeks gestation, survival rates increase roughly 3% with each day of gestational age (Farquarhson, Lange, MacDonald, Morin & Simard, 2005). Birth at less than 26 weeks is associated with a high prevalence of neurologic and developmental disabilities in the infant (Marlow, Wolke, Bracewell & Samara, 2005). Future research might concentrate on whether bed rest has any role in helping to delay the birth by days or longer, thereby improving outcome. However, this research would have the same difficulties as other studies in the area of preterm birth. One of the major problems is having diagnostic accuracy to determine who is actually in preterm labour before beginning any intervention. Secondly, researchers would need to ensure that delaying delivery is the safest option for mother and baby.

It is interesting to question why some care providers do not recommend bed rest for women at risk of preterm birth and others use it despite the fact that they report a lack of confidence in the benefit. In a review of medical practice variations, Westert and Groenewegen (1999) provide a number of possible reasons. They assert that

practice differs because people have learned to place different values on certain practices. This may be related to where a person was educated and the practice of their mentors. Second, individual tolerance of uncertainty differs among caregivers. To reduce uncertainty about a particular issue, the authors suggest there is a tendency to 'do as your colleagues do'. However, in clinical areas where few prospective efficacy studies are available, such as the area of bed rest as a therapy, Westert and Groenewegen (1999) suggest that there is a preference-driven approach and that medical decision making can either be very conservative or intensively interventionist and that either can be considered to be acceptable practice. Another possibility is that physicians conform to the local standards of where they practise. Maloni, Cohen and Kane (1998) supported this assertion when they found that choice of location of bed rest (i.e., hospital or home) and the severity of activity restriction was a function of physicians' practice style.

Less is known about decisions in the case of uncertainty in the midwifery population. In a study of midwives' coping strategies for managing birth uncertainties, Green (2005) discusses how uncertainty can lead to the medicalization of childbirth and defensive practice. She notes a disparity between training in a midwifery model and practising in an obstetric model where risk and risk-benefit calculations become the primary driving force of decisions instead of the importance of the birth experience for the woman. Cioffi and Markham (1997) found that midwives use heuristics, derived mainly from their clinical experiences when faced with difficult case decisions. In regards to the decision about recommending bed rest, Schroeder (1998) had a slightly different perspective. She hypothesized that care providers believed that the risk, in the

case of high-risk pregnancy, was primarily for the fetus and not the mother. Since there didn't seem to be any harm to the fetus during bed rest, care providers could justify its use.

In considering a number of social and practical circumstances (e.g., availability of childcare and help at home, potential for side effects) that might affect decision making about recommending bed rest for a particular woman, over 90 percent of care providers indicated that individual circumstances had varying degrees of importance for them. The exception to this was whether or not a woman could afford to be away from work. For this variable, 20 percent of physicians and 12 percent of midwives said this was not at all important. However, later on in the survey when asked about their concern about economic problems as a side effect of bed rest, midwives and family physicians rated this as the second largest concern, and it was third for obstetricians. Several investigators have identified issues with family income or loss of work as a barrier to women trying to follow recommendations for bed rest (Josten et al., 1995; Maloni et al., 2001; May, 2001; Schroeder, 1998).

Cervical changes, as opposed to other warning signs of preterm labour and birth, including contractions in the preterm period or a previous history of preterm prelabour rupture of the membranes (PPROM), led to higher percentages of care providers reporting that they would recommend bed rest at all gestational ages in both singletons and multiples. It is well established that women with a shortened cervical length have an increased risk of delivering preterm (Berghella & Berghella, 2005; Bernhardt & Dorman, 2004; Iams, 2003; Van den Hof & Crane, 2001; Williams & Iams, 2004). "The risk of spontaneous preterm birth increases as the length of the cervix decreases

across the entire range of cervical lengths. If a woman's cervix is assessed at 22-24 weeks to be below 25 millimetres (10th percentile) she has a more than six-fold increased risk of preterm birth before 35 weeks relative to women whose cervical length is above the 75th percentile" (Iams, 2003, p. 403). Even though the risk is up to six times higher, it still begs the question of what care providers should recommend for this woman in terms of activity once she is deemed to be at higher risk for preterm birth. This is rarely dealt with in studies of cervical length measurement. Iams (2003) presents the Ohio State University Centre protocol for diagnosis of preterm labour and potential preterm birth, which includes various investigations depending on presenting symptoms, length of the cervix, and use of fetal fibronectin testing. However, nothing is discussed about activity recommendations for women when they are advised that they are at higher risk for preterm birth or when results are inconclusive or negative.

Elliot's group (2005) explored this very question in a group of women who had symptoms of preterm labour, but negative fetal fibronectin testing. They found no difference in preterm birth rates between the women randomized to activity restriction post stabilization for preterm labour and those with no activity restriction. This study was confounded however but the use magnesium sulfate as a tocolytic in a group of women who tested negative for fetal fibronectin. It has been established that magnesium sulfate is not an effective tocolytic (Crowther, Hillier & Doyle, 2003) and treatment with tocolytics for women who screened fetal fibronectin negative is a questionable practice.

What makes the dilemma of accurate diagnosis of preterm labour even more compelling is that a large number of care providers in this survey practise in community

hospital settings (45% of physicians and 30% of midwives) where cervical length measurements and fetal fibronectin testing may not be readily available. Slightly less than a third of care providers reported having fetal fibronectin testing available in their centres. These care providers might be treating women on the basis of contractions alone, or contractions combined with other symptoms that can lack sensitivity, and may lead to more recommendations for bed rest or activity restriction (Iams, 2003; Iams et al., 2002). It may be time for national organizations like the SOGC and the Canadian Paediatric Society (CPS) to take on an advocacy role and explore the body of evidence associated with the use of fetal fibronectin and determine if it is the best interest of women and children to encourage more hospitals and care providers to make use of this technology.

Recognizing that there is uncertainty about prescribing or recommending bed rest or activity restriction for women at risk of preterm birth, at least two groups have attempted to determine if bed rest and reduced activity prescribed for women in hospital was different than if prescribed for home. In a randomized trial of women with arrested preterm labor and intact membranes, Yost and colleagues (2005) encouraged women to stay in bed as much as possible but permitted ambulation to the bathroom, living area and shower. Participants were asked to avoid standing as much as possible and to try and become "couch potatoes" (p. 15). They were also asked to avoid sexual intercourse. The same protocol was recommended for women randomized to hospitalization, although the authors noted that bed rest was not strictly enforced. There was also no discussion of how they validated the activity levels of the women assigned to bed rest at home. The outcome for this study was delivery at 36 weeks or greater and

there were no significant differences between the groups (Yost et al., 2005). They concluded that they hadn't answered the question of whether bed rest and activity restriction were useful, only that it didn't matter whether it took place in hospital or at home. Most women would probably appreciate being at home. In a similar Canadian study (Goulet et al., 2001), the same conclusions were reported but activity levels of the women were not discussed.

In most of the clinical scenarios provided in this survey, midwives were more conservative in their recommendations for bed rest than were physicians. A recent article on the paradigm of midwifery care (Craigin, 2004) may help explain this phenomenon. The essential characteristics of the midwifery experience are listed as "1) acknowledgement of connections between the mind and body and the person to the person's life and world; 2) assuming the perspective of the woman to investigate meaning and her experience of symptoms or conditions, so that a plan of care is developed by midwife and woman together; and 3) protection and nurturance of 'normal' in processes related to women's health, implying a judicious use of technology and interventions" (p. 381). This philosophy may also explain why higher percentages of midwives as compared to physicians would recommend some sort of activity restriction at 28 and 32 weeks in cases where women felt stressed, despite having no cervical changes or any history of preterm birth. Reime and colleagues (2004) confirmed that maternity care provider groups have varying attitudes towards birth. They found that obstetricians were the most attached to interventions and technology, midwives the least, while family physicians fell in the middle. This is fairly consistent with findings in this bed rest survey. Of course, it is also possible that midwives are

less interventionist because they just do not have the same experience in seeing the devastating consequences of early preterm birth often seen by obstetricians.

The specific types of activity restriction recommended by Canadian care providers were also dependent on the clinical situation. There was not a great deal of consistency within or between the care provider groups about when to prescribe or recommend that women reduce or stop certain activities such as household tasks, driving the car, work at home, or work outside of the home. Again, the one exception was for women who were pregnant with twins and had a short cervix. In these cases over 90 percent of physicians and 80 percent of midwives would recommend that they stop work outside the home. While most midwives would not have primary responsibility for caring for women with this combination of risk factors, they still could be providing supportive care for these women and talking to their clients about activity levels.

In regards to the other activities, there were various splits among providers depending on who would recommend stopping versus reducing the activity. In addition to reducing or stopping of specific activities, care providers also recommended that women rest for various periods of time during the day either on their couches or beds, and recommended the most stringent activity restrictions for women with a multiple pregnancies. It is difficult for women to comply with these recommendations for activity restriction and various lengths of rest periods (Josten et al., 1995; Maloni et al., 2001; Maloni & Kutil, 2000), and women in these studies provided feedback that they did not feel well supported by their health care provider or that they received contradictory advice. Examples of this included recommendations to stay in bed as

much as possible, but to drink lots of fluids, thus necessitating many trips to the bathroom. Women who were asked to stay on strict bed rest were told that they could get up to come to hospital for a clinic and ultrasound appointment, an activity that often requiring driving, walking and waiting for long periods.

Because nurses are often responsible for implementing the care providers' recommendations and educating women about activity restrictions or bed rest, they can find themselves experiencing dissonance, depending on their viewpoint. Maloni (1998) notes that nurses "struggle with how to advise and advocate for women to avoid the side effects of treatment without undermining patient care, the physician-client relationship, and the woman's sense of hope that the treatment will work" (p.42). Truthful disclosure about diagnosis, prognosis and treatments to patients is evolving among health care providers. Tuckett (2004) suggests that uncertainty is offered as a reason for not disclosing the truth about a treatment or diagnosis.

It is important that nurses be an active part of the discussion about bed rest and activity restriction. We need to start asking primary care providers about the sources of evidence guiding their recommendations for activity restriction and bed rest. For example, is it experiential knowledge alone, or is it based on the experimental and qualitative studies published in the area? What information has been communicated to the patient? Sackett and colleagues (1996) argue that evidence based medicine is an approach to ensure that clinicians consider integrating individual clinical expertise with the ***best available*** external evidence from systematic research when making decisions about patient care. A similar definition in the nursing literature is that evidence-based care incorporates evidence from research, clinical expertise, and ***patient preferences***

into decisions about the health care of their individual patients (Mulhall, 1998). For proponents of evidence-based care, randomized controlled trials have evolved into the premier form of evidence to be considered when making a patient care decision (Kitson, 1997). In this study, there were 154 practitioners who reported they never recommended or prescribed bed rest for women in their homes or in hospital but there were many more (n=362) who did prescribe bed rest. We need to understand more about how clinical practice decisions are made when experimental and qualitative evidence are available but randomized trials are lacking.

Our challenge is to listen carefully and act upon what women have told us in qualitative studies about the challenges associated with bed rest. It is important to review and discuss what women say about side effects with our medical and midwifery colleagues and to plan and carry out further studies, including randomized trials to help establish whether or not bed rest and activity restriction are useful practices for women at risk for preterm birth.

Concerns about the Side Effects Associated with Bed Rest

In Maloni, Cohen and Kane's (1998) survey on the use of bed rest, most physicians were unaware of any side effects of this treatment. In this survey, respondents reported their level of concern about various side effects. Not surprisingly, one of the highest levels of concern was the possibility of deep vein thrombosis. Although it is extremely rare, the consequences are potentially fatal and immobility is known as one of the risk factors in pregnancy for this condition (Greer, 2001; James, Tapson & Goldhaber, 2005). From a nursing perspective however, the high percentage

of care providers who were "not at all concerned or somewhat concerned" about muscle atrophy, bone loss, cardiovascular deconditioning, and fatigue was disturbing. The low numbers of care providers who routinely recommended any sort of rehabilitative exercise program to help women with these problems confirmed this lack of concern. For new mothers, having to be active in caring for a newborn, or resuming family responsibilities, these side effects can be difficult. While the exact incidence of these complications is not known, Maloni (1998) discusses the problems women face after bed rest. They "tire easily, have muscle weakness, deep muscle soreness, shortness of breath, dizziness, difficulty concentrating, decreased stamina, difficulty with ambulation and return to activities of daily living" (p. 40), all while trying to look after a newborn. These symptoms do not resolve quickly and are incremental with the degree of activity restriction (Maloni et al., 1993). Maloni (2002) found that 45 percent of women who had been on bed rest were still experiencing muscle soreness six weeks postpartum and data is lacking on how long recovery takes or whether any permanent damage occurs. Maloni and colleagues (1993) reported that health care providers believed that women would recover quickly from any adverse effects associated with bed rest because of their relative young age and healthy status.

From a nursing perspective, we need to advocate for prevention and rehabilitation strategies for women who experience activity restriction and bed rest. It would be interesting to correlate findings from this survey with a survey of women who experienced bed rest or activity restriction and see if there is congruence between the concerns of women and care providers as this could potentially effect the care plan.

Compliance with Care Provider Recommendations

On average, only about 50 percent of care providers who recommend modified bed rest to women at risk of preterm birth think their recommendations are followed 'most of the time'. Women's dilemmas in maintaining bed rest have been documented (Gupton et al., 1997; Heaman & Gupton, 1998; Josten et al., 1995; Maloni et al., 2001; May, 1994). Josten and colleagues (1995) recommend that care providers take the time to assist women in sorting out the areas of bed rest that are going to be troublesome and help them find solutions. This is work that is well within the scope of nursing practice. Nurses can help to coordinate care with knowledge of the side effects and the reality of the women's lives.

The willingness of women to follow recommendations for bed rest is an important area for further research. Any prospective studies on efficacy of bed rest or activity restriction must find a way to objectively measure how much of the time women are actually following the recommendations.

Decisional Conflict

There is not a great deal of published information about how to interpret the score from Dolan's (1999) *PDPAI* scale. Dolan concluded that higher scores meant there was more discomfort with the decision. There are very few studies that have included data from this scale and even fewer that have used the scale with non-physician care providers (personal communication, Dr. France Légaré, November 28, 2005). The care providers in this study had a mean score of 30 out of 60: the problem

is in determining whether this is a low or moderate degree of decisional conflict and what this means in terms of care provider behaviour. When looking at the individual items on the scale, all three groups had high scores on the item that dealt with the certainty of their decision (item b). Physicians had the highest scores on an item that said the decision was difficult because the information to help them with the decision was either unknown or unavailable in the literature. A lot of the published information in the area of bed rest exists in nursing journals. It would be interesting to know how much cross coverage there is between three main indexes for medical and nursing literature (Medline, PubMed, CINAHL).

In patient populations, information on decisional conflict has been collected using O'Connor's (1999) *Decisional Conflict Scale (DCS)*. This 16-item scale also uses a 5-point Likert-like response. The *DCS* score is obtained from summing the responses to items and then dividing by the total number of items to arrive at the final score. Légaré and colleagues (2003c) used this same approach with the *PDPAI*. When the *PDPAI* total score was reduced for the care providers in this study, the mean *DCS* score was 2.5. O'Connor (1999) reports that a score of 2.5 in a patient population is correlated with decisional conflict and a delay in decision-making. This decisional conflict could be manifested as hesitation, vacillation, feelings of uncertainty, and signs of acute emotional stress (Janis & Mann, 1977). In a qualitative study, Di Caccavo and Reid (1995) provide further insights into this phenomenon in the family practice population. They found that family physicians delayed making difficult decisions by bringing the patient back for another appointment or by shifting the responsibility on to someone else by seeking consultation. While the issue of physicians and midwives

delaying treatment decisions was not explored in this survey, it would be an interesting topic for future research. Also interesting would be to explore the relationship between gestational age, clinical circumstances and decisional conflict. Would decisional conflict scores change when recommending bed rest change at lower and higher ends of preterm gestation, with singleton as opposed to multiple gestation or when considering bed rest for women with shortened cervical length or a positive fetal fibronectin test?

There is not a lot of research exploring whether the measure of decisional conflict is the same in care providers as in patient populations, but Légaré and colleagues (2003c) believe it should be congruent because of the conceptual framework on which the work is based. To test this assumption, Légaré's group explored the differences in scores between the decisional conflict of women and the decisional conflict of their doctors in the context of making decisions about the use of hormone replacement therapy (HRT). In a randomized trial, they compared physician's and women's decisional conflict after using a structured decision aid versus a pamphlet. They found that the main factor associated with a physician experiencing higher decisional conflict than the patient related to whether the decision was a shared one with the patient versus the traditional method of providing advice. However, a major difference between HRT and bed rest/activity restriction lies in the nature of the evidence available to help make the decision. With HRT, there have been many randomized controlled trials and there is now evidence to help guide practitioners and women. Having some evidence is considerably better than having little evidence of efficacy, as is the case with prescribing or recommending bed rest. For the physician group, the highest scores on an individual item on the *PDPAI* scale were related to 'lack

important information being known or a lack of information in the literature' on bed rest.

The side effects of bed rest have been demonstrated (Heaman & Gupton, 1998; Maloni & Park, 2005; Maloni et al., 2004b; Maloni & Schneider, 2002; Schroeder, 1996), but we still do not know if it is of any benefit to women at risk for preterm birth. Even when there are prospective studies or clinical practice guidelines to guide care providers, Garfield and Garfield (2000) assert that clinicians are concerned that guidelines based on randomized trials do not reflect the complexity of the real world; that is the context and framework from which a decision must be made.

Part of the difficulty with the concept of decisional conflict in care providers, just as it is with patients, is that decisions about care are not only based on evidence but on the individual's values (Dowie, 2004; O'Connor, Légaré & Stacey, 2003). Légaré and O'Connor (2003) report that, in situations of physicians counselling patients about a particular decision where the scientific evidence gives no clear preference for either option, a patient's values are rarely discussed and clarified. Little information was found in the research literature about midwives' practices related to decision making and counselling, so it is unknown if this phenomenon is the same for them as it is for physicians. In a study of women's experiences with bed rest (Schroeder, 1996), one theme was the feeling by the women that their health care providers had no concept of what bed rest did to their lives or families. The women felt like they did not have a lot of choice regarding treatment options as often no alternatives were discussed and bed rest was presented as their only chance to deliver a viable infant.

How are the concepts of clinical equipoise and decisional conflict related? Both relate to the principle of uncertainty, but clinical equipoise has been used as the justification for the clinical trial. Freedman (1987) defined clinical equipoise as a state of uncertainty about the relative merits of two arms of a clinical trial. There is some disagreement about whether it is the individual's uncertainty or the community of care provider's uncertainty that should provide the rationale for a clinical trial (Weijer, Shapiro, Cranley & Enkin, 2000). In this study, a 'community' of care providers did have decisional conflict but there was also another 'community' of care providers who are assumed not to have decisional conflict because they reported never recommending bed rest as a therapy for women at risk of preterm birth. Is this true equipoise? Further research is required to determine if there is a relationship between levels of decisional conflict and recommendations for treatment or participation in research.

Research is also needed in the area of what influences care providers' decisional conflict in the area of bed rest as well as in the values underlying the decisions that are eventually made. It would be interesting to determine what would help to reduce decisional conflict. It is likely that some of the conflict would be resolved if results from prospective trials of efficacy were available to help guide care providers. However, this would not address the issue of other aspects that feed into decisional conflict such as unrealistic expectations, unclear norms, unwanted pressure, inadequate support, and inadequate personal and external resources for making decisions about health (Légaré et al., 2003b). It would also be valuable to do a comparison study of the congruence between patients' decisional conflict as compared to their health care providers. There were comments on the survey indicating that, while physicians and

midwives were not convinced that bed rest would help the woman, 'doing something was better than doing nothing'. An interesting area for further exploration would be whether care providers disclose to patients their own decisional conflict about recommending bed rest and whether they tell the patients about the lack of evidence to support or refute what they are recommending.

Contradictions in the Data

A number of contradictions between the evidence and current practice reported by care providers were noted in this study. First, there is an obvious disconnect between care provider's recommendations for bed rest and their belief about its effectiveness in helping to prevent preterm birth. Between 21 and 42 percent of care providers recommend bed rest in hospital and between 50 and 75 percent recommend bed rest at home despite the fact that about two-thirds believe it is only a "fair to poor" intervention in helping to prevent preterm birth. Similarly, 41 to 55 percent of care providers thought activity restriction was only "fair to poor" in helping to prevent preterm birth, but many care providers recommended it in different clinical scenarios. It would be interesting to know more about whether care providers believe that bed rest or activity restriction at home is more easily attainable or less stressful for women and therefore recommended it more often, or whether it is related to a lack of hospital resources.

There were also contradictions related to side effects of bed rest. There is objective evidence of maternal muscle atrophy (Maloni & Schneider, 2002) and antepartum weight loss (Maloni et al., 2004) associated with bed rest. Yet, 53 to 62

percent of care providers were "not at all" or "somewhat concerned" about muscle atrophy and 57 to 75 percent "not at all" to "somewhat concerned" about weight loss. While deep vein thrombosis was the side effect physicians were most concerned about, it is rare whereas muscle atrophy is common. This suggests that either practitioners are not aware of the research evidence about all the physiological side effects, or that they discount it.

When asked about what they considered important prior to recommending bed rest, 50 to 60 percent of care providers indicated the number of children at home and the woman's likelihood of compliance as being "very important" to "extremely important". However, if bed rest is recommended to improve the pregnancy outcome, altering the prescription to meet the woman's circumstances, while a very humane gesture, indicates the arbitrariness with which practitioners recommend bed rest.

Finally, while large numbers of the care provider groups report that they would encourage women to participate in randomized trials about the efficacy of bed rest, less than 50 percent would encourage participation in studies about effects of maternal bed rest on the newborn. A very common indication for bed rest is to reduce the consequences of prematurity or growth restriction for the baby, and therefore, it seems to be a contradiction that care providers would not eagerly support learning more about the effects of the intervention on the baby.

Limitations

Defining the terms strict bed rest, modified bed rest, and activity restriction at the beginning of the survey may have been of benefit to the care providers and helped to improve clarity of the concepts. It is possible that people have slightly different definitions for these terms and it may have affected the responses of some providers to specific questions.

It is appropriate to question whether results from this survey with only 44 percent of the sample providing usable data are representative of the population of Canadian providers of maternity care. It is possible that characteristics of the respondents may differ from non-respondents, although random sampling within the physician groups and the largest midwifery group (Ontario) should minimize this effect. A number of potential biases exist in survey research. Recall bias can happen if questions about behaviour or events are asked a long time after the event. While mail surveys are important in that they remove interviewer bias, it is also possible that what people say they do in responding to a survey is not reflective of their day-to-day practise (self-report bias). Very few validation studies of survey data were located in the literature and those that were found mainly involved comparing chart data with the patient's recollection of care events. It would be interesting to do a validation study to determine the degree of agreement between what perinatal care providers say they do, and their actual clinical practice. However, this type of validation may also limit a person's willingness to participate in a survey.

More data from care providers could have been obtained by having all participants (i.e., those who reported that they never prescribed bed rest) answer the

questions related to activity restriction. Once the physicians or midwives indicated that they generally didn't use bed rest in hospital or at home, they were asked to skip the remaining questions and only provide demographic information at the end of the survey form. Although these care providers did not generally prescribe or recommend bed rest, they may have offered a more comprehensive perspective on activity restriction.

To provide a more complete picture of recommendations for bed rest, it would have been useful if nurses were included in this study. The design of this study could not easily include nurses since they are not, in most cases, providing primary care services. Nurses could, however, have a great influence on women's decisions about following the recommendations of their doctor or midwife. Antepartum home care nurses, antepartum hospital nurses and antepartum clinic nurses all see patients at risk of preterm birth and it would be important to learn more about their perspectives and decisional conflict levels.

Results from this survey should not be extrapolated to bed rest for other obstetric conditions such as hypertension, bleeding, nausea and vomiting, or fetal growth problems. Participants were only asked in the survey about bed rest for issues related to preterm labour and birth.

The *PDPAI* scale is relatively new, and despite good reliability data, there is very little published literature that can be used to inform investigators about how to interpret the data from the instrument. There is also not much information on the relationship between decisional conflict in care providers and their ensuing anxiety and hesitation about treatment recommendations as is reported in the patient literature on decisional conflict.

Despite these limitations, this is one of the first surveys about the issue of bed rest and activity restriction for women at risk of preterm birth in Canada and provides perspective on current practice from a large number of people representing three groups of maternity care providers. A similar survey is taking place in Latin American countries (personal communication, Dr. E. Bergel, University of Buenos Aires, March, 2005). When completed, it will be possible to provide an important comparison of practice patterns around the issue of bed rest in pregnancy. In addition, this survey also has the largest group of care providers to-date to complete the *PDPAI* scale and will add to the body of knowledge about this tool.

Future Research

While the majority of care providers who responded to this survey would encourage their patients to participate in future studies where the efficacy of bed rest is evaluated, designing such a study will be challenging. Accurate sample size calculations depend on determining the main outcomes of the trial and unless a large effect size was anticipated, sample sizes could be very large. In the case of bed rest for threatened preterm birth, it could be as broad as rates of preterm birth, or more specific such as days of gestation gained. It would also be challenging to determine the appropriate intervention. Is it feasible to test home versus hospital bed rest, or home with no activity restriction as compared to hospital bed rest? Eligibility would also have to be considered. Would women be randomized only after a positive fetal fibronectin test or would signs and symptoms of preterm labour be sufficient to conclude that a woman was at risk of preterm birth.

Other important outcomes would be the presence of side effects (physiological and psychosocial), newborn effects, measures of maternal satisfaction and care provider satisfaction, quality of life and cost benefit analysis.

Conclusions

The research question guiding this thesis was to determine under what conditions Canadian obstetricians, family physicians and midwives prescribe or recommend bed rest and activity restriction as a therapy for women at risk of preterm birth. We now know that a large number of Canadian care providers do recommend bed rest in this situation. In this sample, 75 percent of physicians and 57 percent of midwives recommended bed rest either in hospital or home despite the fact that nearly two-thirds of them believe that the utility of bed rest is only *fair* to *poor* in helping to prevent preterm birth and nearly half think the same about activity restriction. In regards to the conditions of use, the key word is inconsistency. Other than in the situation of a woman with a twin pregnancy and a shortened cervix, health care provider groups are not consistent in their recommendations for bed rest and specific types of activity restriction. Cervical changes as opposed to other signs and symptoms of preterm labour led to more frequent recommendations for bed rest in women experiencing both singleton and multiple pregnancies across all gestational ages. Obstetricians, family physicians and midwives all have a degree of decisional conflict about recommending bed rest and, although it is far from clear what this means in terms of care provider behaviour or practice, there could be delay in decision making, hesitation, vacillation, uncertainty, and at higher levels, emotional stress.

The controversy about whether or not to prescribe bed rest has been prominent in the obstetric literature since the early 1990s. In two American studies (Goldenberg et al., 1994; Maloni et al., 1998) the obstetric community was alerted to the very frequent use of bed rest despite many physiological and psychosocial side effects. In this study, findings that are similar to those in the United States are supported in the data analyses; i.e., bed rest continues to be used by many care providers. The large numbers of care providers using this therapy, and also the decisional conflict that they experience provides more background data to support the need for well-controlled studies such as randomized trials. Many of the care providers who responded to this study would support this and would encourage their patients to participate.

As nurses are often the ones responsible for helping women attain and maintain bed rest or various degrees of activity restriction that are recommended, the results of this research are important to them. Knowing that obstetricians, family physicians and midwives have doubts about the effectiveness of bed rest for women at risk of preterm birth, and that they experience some degree of decisional conflict in recommending these interventions to women, should make them feel more confident in engaging in the discussion about an optimal treatment plan for affected women. Knowledge of these doubts is also useful when nurses advocate for their patients by encouraging the health care team to consider women's values and preferences when making a therapeutic decision about bed rest. For physicians and midwives, the results are important in that they have a perspective of their colleagues' practice patterns and inconsistencies surrounding the issue of bed rest for women at risk of preterm birth. For researchers, this survey provides additional background evidence to support the need for prospective

trials as many care providers are recommending an intervention for which they have doubts about the efficacy and doing so causes them some degree of decisional conflict.

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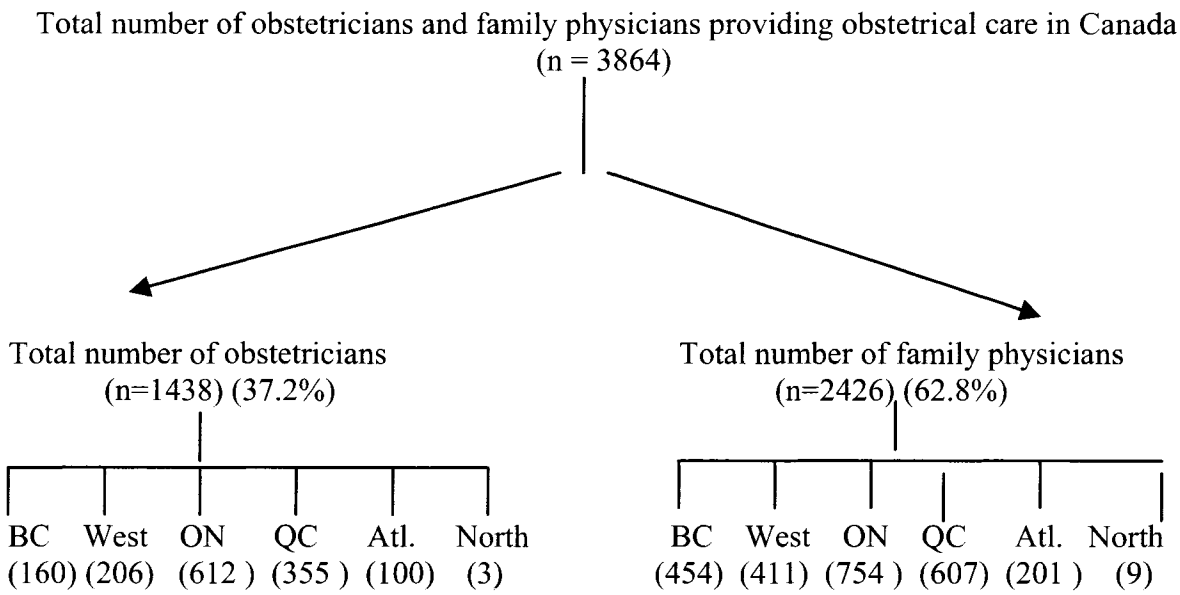
Appendix A
Proportionate Stratified Sampling Strategy for Physicians

Data on numbers of practitioners provided by MD Select - Canadian Medical Directory (January, 2005)



- If we sample 15% of the total population (n = 3864) we would need to sample of 580 physicians
- To make the sample representative of the groups, we would need 37.2% obstetricians (n = .372 x 580 = 216) and 62.8% family physicians (n = .628 x 580 = 364)
- Because of the potential for non-response of up to 50%, the sample size in each group will doubled:
    - Obstetrician sample of 216 x1 = 216, therefore total sample will be 216 + 216 (n = 432)
    - Family physician sample of 364 x 1= 364, therefore total sample will be 364 + 364 (n = 728)

To ensure that the sample is selected so that numbers of obstetricians and family physicians are proportional to the proportion of care providers within the regions, the following calculations have be used:

OBSTETRICIANS

	(A) Obstetricians	(B) Percent of Total Obstetricians in Canada (A/1438)	(C) Total Number of Obstetricians required in the sample	Required Random Sample of Obstetricians in Each Region (B x C)
BC	160	11.1%	432	48
West	206	14.3%	432	62
Ontario	613	42.6%	432	184
Quebec	356	24.8%	432	107
Atlantic	100	7%	432	30
North	3	0.2%	432	**3***
Totals	**1438**	**100.0%**	432	**434**

**** Due to the small number of obstetricians in the North - all will be included)***

FAMILY PHYSICIANS

	(A) Family Physicians	(B) Percent of Total Family Physicians in Canada (A/2436)	(C) Total Number of Family Physicians required in the sample	Required Random Sample of Family Physicians in Each Region (B x C)
BC	454	18.6%	728	136
West	411	16.9%	728	123
Ontario	754	31%	728	225
Quebec	607	24.9%	728	181
Atlantic	201	8.3%	728	60
North	9	0.4%	728	**9***
Totals	**2581**	**100.0%**	**728**	**734**

**** Due to the small number of family physicians in the North - all will be included)***

- West includes Alberta, Saskatchewan, and Manitoba
- Atlantic includes New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland
- North includes Northwest Territories, Yukon and Nunavut

For the regions that have been grouped together (West, Atlantic and the North) it is important to ensure that the sample from these areas is representative of the proportion of care providers in each province/territory.

- The total numbers of obstetricians and family physicians per province/territory are provided
- In the middle columns, the number of obstetrical and family practice physicians are each expressed as a percent of the total obstetricians and family physicians providing obstetrical care in Canada
- This percentage is then multiplied by the total sample size required to provide the number of care providers that should be surveyed in the merged areas for the survey to be representative.

- Using the Western region as an example – for the 62 obstetricians who need to be surveyed, 15 should be from Manitoba, 11 from Saskatchewan and 36 from Alberta.

	OB	FP	Total	OB	FP	Total		OB	FP	Total
NF	20	38	58	0.52%	.98%	1.5%	NF	6	11	17
PEI*	5	6	11	0.13%	0.16%	0.29%	PEI*	2	2	3
NS	46	93	139	1.19%	2.41%	3.6%	NS	14	28	42
NB	29	54	83	0.75%	1.40%	2.15%	NB	9	16	25
QC	356	607	963	9.21%	15.71%	24.92%	QC	107	182	289
ON	613	754	1367	15.86%	19.51%	35.38%	ON	184	226	410
MB	49	71	120	1.27%	1.84%	3.11%	MB	15	21	36
SK	37	63	100	0.96%	1.63%	2.59%	SK	11	19	30
AB	120	277	397	3.11%	7.17%	10.27%	AB	36	83	119
BC	160	454	614	4.14%	11.75%	15.89%	BC	48	136	184
YK	1	4	5	0.03%	0.10%	0.13%	YK*	0	1	2
NWT/ Nunavut	2	5	7	0.05%	0.13%	0.18%	NWT/ Nunavut*	1	2	2
	1438	2426	3864	37.22%	62.78%	100.00%		432	728	1160
Actual Total							(including PEI and North extras)	437	739	1176

* Because of the small numbers in PEI and the North, all care providers will be sampled to ensure that each province is represented. This will be reflected in the total 1160 + 16 = 1176

TOTAL SAMPLE SIZE FOR PHYSICIANS

The total sample size of physicians for the study (**n = 1176**) will be made up of obstetricians (n = 437) plus family physicians (n = 739).

Appendix B – Validity Testing Participants

Initial Focus Group

Ms. Debra Kaye	Antenatal Home Care Program	Ottawa, ON
Dr. Erica Eason	Obstetrician/Gynecologist	Ottawa, ON
Dr. Kathryn Reducka	General Practitioner	Pembroke, ON
Ms. Bobbi Soderstrom	Midwife	Ottawa, ON
Dr. Gail Webber	Family Physician	Ottawa, ON

Content Validity Testing Group

Dr. Sharon Caughey	Obstetrician/Gynecologist	Ottawa, ON
Dr. William Ehman	Family Physician	Nanaimo, BC
Dr. Michael Helewa	Obstetrician/Gynecologist	Winnipeg, MB
Dr. Eileen Hutton	Midwifery Professor	Vancouver, BC
Dr. Owen Hughes	Family Physician	Ottawa, ON
Dr. Jennifer Medves	Nurse-Midwife	Kingston, ON
Dr. Nan Okun	Perinatologist	Toronto, ON
Ms. Vicki Van Wagner	Midwife	Toronto, ON

French Reviewers

Dr. Daniel Blouin	Perinatologist	Sherbrooke, QC
Mr. Raymond Martel	Translator	Ottawa, ON
Ms. Marie-Josée Trépanier	Perinatal Coordinator	Ottawa, ON

Pre-Testing Group

Dr. Hani Akoury	Perinatologist	Toronto, ON
Dr. Daniel Blouin	Perinatologist	Sherbrooke, QC
Dr. Stan Brown	Obstetrician, SOGC	London, ON
Dr. Bill Ehman	Family Physician	Nanaimo, BC
Dr. Brian Geller	Family Physician	Meadow Lake, SK
Dr. Owen Hughes	Family Physician	Ottawa, ON
Dr. Ian Lange	Perinatologist	Calgary, AB
Dr. J.K. Milne	Obstetrician, SOGC	London, ON
Dr. Carl Nimrod	Perinatologist	Ottawa, ON
Ms. Bobbi Soderstrom	Midwife	Ottawa, ON

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Appendix C- Content Validity Index Testing Tool

November 17, 2004

As a follow-up to our recent communication, here is the survey instrument for the study on the use of bed rest in pregnancy. The purpose of the survey is *to determine how often and under what circumstances practitioners recommend bed rest or some type of activity restriction for women who are at risk for delivering preterm.* It will be administered to a random sample of obstetricians and family physicians listed in the MD Select Canadian Medical Directory and all active members of the Canadian Midwifery Association. The goal is that a participant will complete the survey in 15 minutes.

You agreed to assess the survey tool for **content validity** – the degree to which this instrument adequately samples the domain of interest. After each question, there is a brief question about the validity of that question. Please complete the content validity question for each of the items on the survey, and again at the end for the survey, thinking about the whole survey, and not just an individual question.

The content was developed based on a review of the literature and one other survey in the United States that was done in a similar population. It has been reviewed by a focus group of participants and revised prior to asking you for your evaluation. Please feel free to suggest changes by writing on the survey as you complete the assessment of content validity.

If you would like to see the layout and length of the survey without the content validity questions, a clean copy of the survey is also attached. The regular survey is 10 pages.

For ease of completion, the questionnaire has been designed as a form. When you click on a shaded box, an "x" will be inserted in the box. Where there is a large shaded area, you can type in comments.

You can return this to me by email or if you would prefer to fax, it can be sent to my attention at

Because you can't alter any of the text when the form is locked, you may wish to turn it off if you want to make suggestions about question format. To turn it off – go to View, choose Toolbars, choose Form toolbar. When the menu comes up, click on the little symbol of the lock – this turns the form capability on and off.

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Date:

Dear (Insert personalized name)

We are requesting your participation in a short survey *to determine how often and under what circumstances you recommend bed rest or some type of activity restriction for women who might be at risk for delivering preterm.* **Preterm birth is one of the most pressing problems in perinatal care and there is limited information on interventions that make a difference. The survey should not take longer than 15 minutes to complete.** *The results will provide background information to guide further studies related to the use of bed rest in pregnancy.*

A random sample of family physicians and obstetricians from a list provided by MD Select Directory and all members of the Canadian Midwifery Association are being asked to complete the survey.

The University of Alberta Human Research Ethics Board has approved the study. The Alberta Heritage Foundation for Medical Research (AHFMR) funded the study. Researchers and clinicians at the Universities of Alberta, Ottawa, and Manitoba are carrying out the study. There are no known risks to taking part in the survey. You have the right to refuse to answer any question on the survey.

Completing and returning the survey indicates your consent to participate. All information you provide will be confidential, except when professional codes of ethics or legislation require reporting. The code number at the top of the survey is linked to your name only for sending reminder notices and to determine response rates by region of the country. The master-coding list that links your name with the code number is kept by the principal investigator and not shared with other persons. The information you provide will be kept in a secure area for at least five years upon study completion. Your name or any other identifying information will not be attached to the information you gave. Your name will also never be used in any presentations or publications of the study results. The information gathered for this study may be used again in the future to help us answer other study questions. If so, an ethics board must first approve the study.

If you have any concerns about the conduct of this study, please feel free to contact Dr. Marion Allen, Associate Dean, Faculty of Nursing, University of Alberta (780-492-6764). She is independent from this study.

We appreciate your feedback for this important issue.

Sincerely,

Ms. Ann Sprague – PhD Candidate, Faculty of Nursing, University of Alberta and Coordinator, Perinatal Partnership Program of Eastern and Southeastern Ontario
Dr. Beverley O'Brien – Professor, Faculty of Nursing, University of Alberta
Dr. Christine Newburn-Cook – Associate Professor, Faculty of Nursing, University of Alberta
Dr. Carl Nimrod – Professor and Chair, Department of Obstetrics and Gynecology, University of Ottawa Dr. Maureen Heaman – Associate Professor, Faculty of Nursing, University of Manitoba

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Survey About the Use of Bed Rest and Activity Restriction in **Women at Risk of Preterm Birth**

Code # _____

Introduction

We want to know ***how often and under what conditions*** physicians and midwives use bed rest or some form of activity restriction for women who are at risk for preterm birth. Please take a moment to share your ideas. *Answer the questions as if you were the person most responsible for this woman's care even if you would usually transfer care to someone else.*

Instructions

Please complete this questionnaire ***ONLY*** if you provide prenatal care.

If you do not provide prenatal care, please place an **X** in this box and return the questionnaire anyway. This will help us to have a better idea of our true response rate

☐ I do **NOT** provide prenatal care for women

Please complete this questionnaire and return it via mail in the accompanying pre-addressed, postage-paid envelope or FAX it to us at ..... ***within one week of receipt.*** Please answer the question in the space provided. Some space has been left for comments and we welcome your feedback. If you require more space when providing comments, please attach a separate sheet.

1. In your own practice, how often do you encounter a pregnant woman who could be at risk for preterm birth due to ***ANY*** reason (e.g. previous preterm birth; multiple pregnancy; any signs and symptoms such as contractions or backache or fluid loss; shortened cervical length; positive fetal fibronectin test; or, lifestyle or social risk factors)?

   ☐ Daily
   ☐ Weekly
   ☐ Monthly
   ☐ Yearly

   CVI: This question is ☐ not relevant

   ☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

   ☐ relevant but needs minor alteration (please elaborate)

   ☐ very relevant and succinct

2. Overall, how would you rate the effectiveness of bed rest to prevent preterm birth?

   ☐ Excellent
   ☐ Very Good
   ☐ Good
   ☐ Fair
   ☐ Poor

   CVI: This question is ☐ not relevant

   ☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

3. Do you generally recommend/encourage bed rest either in hospital or at home as part of the therapy for women at high risk of preterm birth?

Location	Yes	No
In Hospital		
At Home		

If you answered NO to **both** questions, skip to question # 10

If you answered YES to **either** question, continue on with question # 4

CVI: This question is ☐ not relevant

☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

4. On a scale of 1 (not at all important) to 5 (very important), indicate the weight you place on each of the following considerations before recommending bed rest to women at risk for preterm birth (circle the corresponding number):

	Not at all important	Somewhat important	Important	Very important	Extremely important
Whether she can afford to be away from work	1	2	3	4	5
Whether she has help at home	1	2	3	4	5
Number of other children at home	1	2	3	4	5
Her likelihood of compliance	1	2	3	4	5
The side effects of bed rest	1	2	3	4	5
Her social support network	1	2	3	4	5

CVI: This question is ☐ not relevant

☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

5. When you recommend that women go on bed rest during pregnancy for signs/symptoms of preterm labour, how much of the time do you feel they follow your recommendation?

☐ Not at all
☐ Sometimes
☐ Most of the time
☐ All of the time

CVI: This question is ☐ not relevant

☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

6. Circle the number that corresponds to your degree of concern about these potential side effects of bed rest during pregnancy.

Side Effect	**Not at all concerned**	**Somewhat concerned**	**Concerned**	**Very concerned**	**Extremely concerned**	**Not aware of this side effect**
Muscle atrophy	1	2	3	4	5	6
Change in bone mass	1	2	3	4	5	6
Cardiovascular deconditioning	1	2	3	4	5	6
Fatigue	1	2	3	4	5	6
Weight loss	1	2	3	4	5	6
Deep vein thrombosis	1	2	3	4	5	6
Stress	1	2	3	4	5	6
Depression	1	2	3	4	5	6
Sleep disturbances	1	2	3	4	5	6
Economic problems	1	2	3	4	5	6

CVI: This question is ☐ not relevant

☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

Do you routinely recommend any sort of exercise program for women on any degree of bed rest?

☐ No

☐ Yes (specify)

_____

_____

CVI: This question is ☐ not relevant

☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

Do you routinely recommend any sort of social support for women on any degree of bed rest?

☐ No

☐ Yes (specify)

_____

_____

CVI: This question is ☐ not relevant

☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

7. If you saw a woman at each of the following gestational ages with the clinical situations provided, circle yes (Y) or no (N) to indicate whether or not you would ask her to go on bed rest.

Clinical Situation	24 weeks		28 weeks		32 weeks	
A previous preterm birth at 26 weeks gestation but has no signs or symptoms of preterm labour now.	Y	N	Y	N	Y	N
A history of prelabour rupture of membranes in 2 previous pregnancies at 28 and 32 weeks – no cervical changes or contractions now.	Y	N	Y	N	Y	N
Twin pregnancy – no complications.	Y	N	Y	N	Y	N
Twin pregnancy with increased uterine activity but a long, closed cervix.	Y	N	Y	N	Y	N
Twin pregnancy with evidence of cervical change, but no contractions.	Y	N	Y	N	Y	N
Singleton pregnancy with evidence of cervical change, but no contractions.	Y	N	Y	N	Y	N
Feeling very stressed at work, occasional contractions, no cervical changes, no history of preterm birth.	Y	N	Y	N	Y	N

CVI: This question is ☐ not relevant

☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

8. In the following 3 clinical scenarios, ***decide*** whether you would ask a woman to restrict her activity, and if so, the degree of restriction you would suggest

Scenario 8A

The woman had a previous preterm birth at 31 weeks gestation. Presently she is 28 weeks gestation and is in for a routine prenatal visit. Until now, there have been no pregnancy complications. She states she has been feeling some occasional contractions but has no other symptoms. She works in an office that she feels is a moderately stressful environment. She has a stable family environment and good support. You book a follow-up appointment and schedule an ultrasound.

☐ I would NOT recommend activity restriction (***go to Scenario 8B.***)

☐ I WOULD recommend restricting one or more of the following activities (check all that apply from below)

Working outside the home	☐ none	☐ reduced hours	☐ I don't usually address this
Work at home (home office)	☐ none	☐ reduced hours	☐ I don't usually address this
Child care responsibilities	☐ none	☐ reduced hours	☐ I don't usually address this
Household tasks (laundry, cleaning)	☐ none	☐ reduced hours	☐ I don't usually address this
Meal preparation	☐ none	☐ reduced hours	☐ I don't usually address this
Walking around outside	☐ none	☐ reduce	☐ I don't usually address this
Driving the car	☐ none	☐ reduced time	☐ I don't usually address this
Sexual activity	☐ none	☐ reduce	☐ I don't usually address this

In this clinical situation, I would generally recommend:

☐ rest for 1-2 hours on couch/bed 2 to 3 times per day

☐ majority of time on couch/bed with bathroom privileges

☐ strict bed rest, no bathroom privileges

☐ Other: (describe)

_____

_____

For how long would you ask her to restrict her activity (check all that apply):

- ☐ until the ultrasound report is available
- ☐ until she stops contracting
- ☐ until she feels less stressed
- ☐ until 36-37 weeks
- ☐ other (specify)

_____

CVI: This question is ☐ not relevant

☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

Scenario 8B

The woman is pregnant for the first time with twins. She is currently 26 weeks gestation. She is admitted to the hospital with contractions. The cervical length by ultrasound has shortened from 25 mm to 10mm. Fetal growth and biophysical parameters are normal. If everything stays stable for a few more days she will be discharged home. She asks you what you would recommend in terms of activity when at home.

☐ I would NOT recommend activity restriction (***go to Scenario 8C***.)

☐ I WOULD recommend restricting one or more of the following activities (check all that apply from below)

Working outside the home	☐ none	☐ reduced hours	☐ I don't usually address this
Work at home (home office)	☐ none	☐ reduced hours	☐ I don't usually address this
Household tasks (laundry, cleaning)	☐ none	☐ reduced hours	☐ I don't usually address this
Meal preparation	☐ none	☐ reduced hours	☐ I don't usually address this
Walking around outside	☐ none	☐ reduce	☐ I don't usually address this
Driving the car	☐ none	☐ reduced time	☐ I don't usually address this
Sexual activity	☐ none	☐ reduce	☐ I don't usually address this

In this clinical situation, I would generally recommend:

☐ rest for 1-2 hours on couch/bed 2 to 3 times per day

☐ majority of time on couch/bed with bathroom privileges

☐ strict bed rest, no bathroom privileges

☐ Other: (describe)

_____

_____

For how long would you ask her to restrict her activity:

☐ until she delivers

☐ until she is stable at home for a week

☐ until 36-37 weeks

☐ other (specify)

_____

CVI: This question is ☐ not relevant

☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

Scenario 8C

A primigravid woman with no pregnancy complications at 30 weeks gestation complains of regular tightenings for the last couple of days and back pain. When you see her in the office you can palpate contractions. When you send her for ultrasound, the cervical length is normal

☐ I would NOT recommend activity restriction (***go to Question 9.***)

☐ I WOULD recommend restricting one or more of the following activities (check all that apply from below)

Working outside the home	☐ none	☐ reduced hours	☐ I don't usually address this
Work at home (home office)	☐ none	☐ reduced hours	☐ I don't usually address this
Household tasks (laundry, cleaning)	☐ none	☐ reduced hours	☐ I don't usually address this
Meal preparation	☐ none	☐ reduced hours	☐ I don't usually address this
Walking around outside	☐ none	☐ reduce	☐ I don't usually address this
Driving the car	☐ none	☐ reduced time	☐ I don't usually address this
Sexual activity	☐ none	☐ reduce	☐ I don't usually address this

In this clinical situation, I would generally recommend:

☐ rest for 1-2 hours on couch/bed 2 to 3 times per day

☐ majority of time on couch/bed with bathroom privileges

☐ strict bed rest, no bathroom privileges

☐ Other: (describe)

_____

_____

For how long would you ask her to restrict her activity:

☐ until she delivers

☐ until she is stable at home for a week

☐ until 36-37 weeks

☐ other (specify)

_____

CVI: This question is ☐ not relevant

☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

9. This validated scale measures your degree of comfort with a particular treatment decision you have made. Please complete the following questions ***with respect to the last woman to whom you recommended bed rest as a therapy for threatened preterm birth***:

Statement	Strongly Agree	Agree	Undecided	Disagree	Strongly disagree
a. The decision to recommend bed rest was hard to make.	1	2	3	4	5
b. I was unsure whether bed rest would really be best for this woman.	1	2	3	4	5
c. It was clear that bed rest would be best for this woman.	1	2	3	4	5
d. When making the decision, I felt I did not know enough about treatment alternatives, although the information is available in the literature.	1	2	3	4	5
e. I had trouble making the decision because important information on bed rest is either unknown or not readily available in the literature	1	2	3	4	5
f. When I made the decision, it was hard to decide if the benefits of bed rest/activity restriction were more important that the risks or vice versa.	1	2	3	4	5
g. It was easy to identify all the considerations that affect the decision to recommend bed rest/activity restriction.	1	2	3	4	5
h. I fully understand the patient's views regarding the important issues in making this decision.	1	2	3	4	5
i. I believe that the patient fully understands the risks and benefits of bed rest/activity restriction that I recommended.	1	2	3	4	5
j. I believe that the patient will comply with the bed rest/activity restriction regimen I recommended.	1	2	3	4	5
k. I am satisfied with the decision that was made.	1	2	3	4	5

l. I am satisfied that the process used to make the decision for bed rest/activity restriction was as good as it could be.	1	2	3	4	5

CVI: This question is ☐ not relevant

☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

General Information

10. Does your hospital use fetal fibronectin testing to help determine if women in suspected preterm labour should be admitted?

- ☐ Yes
- ☐ No
- ☐ I don't know

CVI: This question is ☐ not relevant

☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

11. Does the place where you work/hospital/health region have any clinical practice guidelines about the use of bed rest/activity restriction for women at risk of preterm birth?

- ☐ Yes
- ☐ No
- ☐ I don't know

CVI: This question is ☐ not relevant

☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

12. What type of care provider are you?

☐ obstetrician
☐ family physician
☐ midwife

CVI: This question is ☐ not relevant

☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

13. What is your present age? ☐☐ years

CVI: This question is ☐ not relevant

☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

14. How many years have you been providing maternity care? ☐☐ years

CVI: This question is ☐ not relevant

☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

15. Are you

☐ female
☐ male

CVI: This question is ☐ not relevant

☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

16. How would you describe your practice setting? (mark all that apply)

☐ urban/suburban
☐ small town
☐ rural
☐ isolated

CVI: This question is ☐ not relevant

☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

17. Is the hospital you are associated with, a: (mark one)

☐ teaching hospital
☐ community hospital
☐ not associated with a hospital
☐ other (please specify):

_____

CVI: This question is ☐ not relevant

☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

18. Would you encourage your patients/clients to participate in any of the following types of studies about bed rest in pregnancy? (check all that apply)

- ☐ A randomized controlled trial to evaluate usefulness of bed rest
- ☐ Studies of the physiological side effects
- ☐ Studies of the psychosocial side effects
- ☐ Studies of the newborns of women who have been on bed rest
- ☐ Other: what type of research would you like to see completed:

_____

_____

CVI: This question is ☐ not relevant

☐ unable to assess relevance without item revision or item is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

Is there anything else you would like to tell us about the use of bed rest/activity restriction for women at risk of preterm birth?

_____

_____

_____

_____

Thank You – Your Input is Valuable!

Return this survey in the pre-addressed postage-paid envelope or FAX your reply to:_____

Overall Evaluation of the Survey:

CVI: This survey is

☐ not relevant

☐ unable to assess relevance without survey revision or survey is in need of such revision that it would no longer be relevant (please elaborate)

☐ relevant but needs minor alteration (please elaborate)

☐ very relevant and succinct

Is there anything else you feel we have not addressed adequately in the survey?

We are a little concerned about the length of the survey. To enhance response rate, we want this to be completed in 15 minutes or less. Is this feasible?

☐ Yes
☐ No

Are there any questions you think could be deleted? Do we need all 3 of the scenarios in # 8 or do you have any suggestions for condensing these?

Appendix D– Pre-Notice Letter
English and French

March 1, 2005

Dear* :

A few days from now you will receive in the mail a request to fill out a brief questionnaire for an important research project. ***We are interested in learning more about the use of bed rest as a therapy in pregnancy. The survey is being sent to obstetricians, family physicians and midwives.***

We are writing in advance because we have found many people like to know ahead of time that they will be contacted. The study is important in that there is very little published information on how often therapeutic bed rest is used during pregnancy.

There are 2 options for returning the survey. You will be able to return it in a postage-paid envelope or by FAX.

We hope you will take the time to complete the survey and return it. It's only with the generous help of people like you that our research project will be successful.

Sincerely,

Ms. Ann Sprague – PhD Candidate, Faculty of Nursing, University of Alberta and Coordinator, Perinatal Partnership Program of Eastern and Southeastern Ontario (PPPESO)

On behalf of the research team

Dr. Beverley O'Brien – Professor, Faculty of Nursing, University of Alberta

Dr. Christine Newburn-Cook – Associate Professor, Faculty of Nursing, University of Alberta

Dr. Carl Nimrod – Professor and Chair, Department of Obstetrics and Gynecology, University of Ottawa

Dr. Maureen Heaman – Associate Professor, Faculty of Nursing, University of Manitoba

*** English letters were addressed to Dear Dr. ..... and the midwifery letters were addressed to Dear Ms.....**

Le 1cr mars 2005

Docteure*,

D'ici quelques jours, vous recevrez par la poste une lettre vous demandant de répondre à un bref questionnaire aux fins d'un important projet de recherche. ***Plus précisément, nous aimerions en savoir plus sur le recours au repos au lit comme thérapie pendant la grossesse. Le questionnaire s'adresse aux sages-femmes, aux obstétriciennes et obstétriciens, et aux médecins de famille (omnipraticiens).***

L'expérience révèle que bon nombre de personnes aiment savoir à l'avance que leur participation sera sollicitée; c'est donc pourquoi nous vous envoyons ce pré-avis. Soulignons en même temps que cette étude est d'autant plus importante vu la pénurie de publications officielles sur la fréquence d'utilisation du repos au lit comme thérapie pendant la grossesse.

Vous pouvez nous renvoyer votre questionnaire de deux façons, soit par courrier normal dans une enveloppe pré-affranchie, soit par télécopieur.

Bien sûr, nous comptons beaucoup sur votre participation, car le succès ultime du projet repose sur la bienveillante collaboration de gens comme vous.

Très cordialement,

Ann Sprague, candidate au doctorat, Faculty of Nursing, University of Alberta et coordonnatrice, Programme de partenariat périnatal de l'est et du sud-est de l'Ontario (PPPESO)

Au nom de l'équipe de recherche

Beverley O'Brien, professeure, Faculty of Nursing, University of Alberta

Christine Newburn-Cook, professeure agrégée, Faculty of Nursing, University of Alberta

Carl Nimrod, professeur et directeur, Département d'obstétrique et de gynécologie, Université d'Ottawa

Maureen Heaman, professeure agrégée, Faculty of Nursing, University of Manitoba

* For the French midwives, the salutation was Madame. For the French male physicians, the salutation was Docteur

Appendix E– Survey Cover Letter
English and French

March 8, 2005

Dear* :

We are requesting your participation in a short survey *to determine how often and under what circumstances you recommend bed rest or some type of activity restriction for women who might be at risk for delivering preterm.* **Preterm birth is one of the most pressing problems in perinatal care and there is limited information on interventions that make a difference. The survey should not take longer than 15 minutes to complete.** *The results will provide background information to guide further studies related to the use of bed rest in pregnancy.*

You were randomly selected to receive this survey from a list provided by MD Select Directory or one of the provincial midwifery associations.

The University of Alberta Human Research Ethics Board has approved the study. The Alberta Heritage Foundation for Medical Research (AHFMR) funded the study. Researchers and clinicians at the Universities of Alberta, Ottawa, and Manitoba are carrying out the study. There are no known risks to taking part in the survey. You have the right to refuse to answer any question on the survey.

Completing and returning the survey indicates your consent to participate. All information that you provide will be held confidential, except when professional codes of ethics or legislation require us to report it. The code number on the survey is linked to your name only so that we can send reminder notices and determine response rates by region of the country. The master-coding list that links your name with the code number is kept by the principal investigator and not shared with anyone else. The information you provide will be kept in a secure area for at least five years upon study completion. Your name or any other identifying information will not be attached to the information you gave. Your name will never be used in any presentations or publications of the study results. The information gathered for this study may be used again in the future to help us answer other study questions. If so, an ethics board must first approve the study.

If you have any concerns about the conduct of this study, please feel free to contact Dr. Marion Allen, Associate Dean, Faculty of Nursing, University of Alberta (780-492-6764). She is independent from this study but familiar with the protocol and University policies.

We appreciate your feedback for this important issue.

Sincerely,

Ms. Ann Sprague – PhD Candidate, Faculty of Nursing, University of Alberta and Coordinator, Perinatal Partnership Program of Eastern and Southeastern Ontario (PPPESO)

On behalf of the research team

Dr. Beverley O'Brien – Professor, Faculty of Nursing, University of Alberta
Dr. Christine Newburn-Cook – Associate Professor, Faculty of Nursing, University of Alberta
Dr. Carl Nimrod – Professor and Chair, Department of Obstetrics and Gynecology, University of Ottawa
Dr. Maureen Heaman – Associate Professor, Faculty of Nursing, University of Manitoba

*** English letters were addressed to Dear Dr. ..... and the midwifery letters were addressed to Dear Ms.....**

Le 8 mars 2005

Docteure,*

Nous vous demandons de remplir un court sondage pour nous aider *à déterminer comment souvent et pourquoi vous recommandez le repos au lit ou d'autres limitations d'activité aux femmes qui seraient peut-être à risque d'accoucher prématurément.* **Rappelons que les naissances prématurées figurent parmi les problèmes les plus urgents en périnatalité et que peu d'information existe sur les interventions efficaces à ce chapitre. Il vous faudra à peine 15 minutes pour répondre au questionnaire, mais** *les résultats alimenteront de futures études sur le recours au repos au lit pendant la grossesse.*

Votre nom a été repêché au hasard pour le sondage, à partir d'une liste fournie soit par MD Select Directory, soit par une association provinciale de sages-femmes.

Le *University of Alberta Human Research Ethics Board* a approuvé l'étude, et *l'Alberta Heritage Foundation for Medical Research (AHFMR)* veille à son financement. Des équipes cliniques et scientifiques des universités de l'Alberta, du Manitoba et d'Ottawa en assurent l'exécution. Votre participation ne présente aucun risque connu, et vous pouvez refuser de répondre à n'importe quelle des questions.

Le fait de remplir et de nous retourner le sondage sous-entend votre consentement d'y participer. Tous les renseignements que vous nous confiez demeurent confidentiels, sauf si les lois ou les codes de déontologie professionnelle nous obligent de les dévoiler.

La cote sur le questionnaire est assignée à votre nom tout simplement pour nous permettre d'envoyer des rappels et de calculer les taux de réponse pour chaque région du pays. La liste de contrôle des cotes qui rattache votre nom à une cote précise est conservée strictement par la chercheure principale, à l'abri de toute autre personne. Une fois l'étude terminée, les renseignements que vous fournissez sont conservés dans un lieu sûr pour au moins cinq ans. Ni votre nom, ni aucun autre renseignement permettant de vous identifier n'accompagne vos réponses. Votre nom ne sera jamais mentionné dans les exposés ou publications sur les résultats de l'étude. Il se peut que les renseignements recueillis dans le cadre de cette étude servent à répondre aux questions d'autres études à l'avenir, mais un conseil de déontologie doit d'abord approuver ces études, le cas échéant.

Pour toute préoccupation au sujet de l'étude, n'hésitez surtout pas à communiquer avec la professeure Marion Allen, doyenne associée, Faculty of Nursing, University of Alberta (780-492-6764). Bien qu'elle ne soit pas liée à l'étude comme telle, elle connaît bien les protocoles et les règles de cet établissement.

Merci sincèrement à l'avance de partager vos avis sur cette grande question.

Ann Sprague, **candidate au doctorat, Faculty of Nursing, University of Alberta et coordonnatrice, Programme de partenariat périnatal de l'est et du sud-est de l'Ontario (PPPESO)**

Au nom de l'équipe de recherche

Beverley O'Brien, **professeure, Faculty of Nursing, University of Alberta**
Christine Newburn-Cook, **professeure agrégée, Faculty of Nursing, University of Alberta**
Carl Nimrod, **professeur et directeur, Département d'obstétrique et de gynécologie, Université d'Ottawa**
Maureen Heaman, professeure agrégée, Faculty of Nursing, University of Manitoba

* For the French midwives, the salutation was Madame. For the French male physicians, the salutation was Docteur

UNIVERSITY OF ALBERTA

Appendix F – English Survey

The Use of Bed Rest or Activity Restriction in **Women at Risk of Preterm Birth**

Code # _____

Introduction

We want to know ***how often and under what conditions*** physicians and midwives recommend/prescribe bed rest or some form of activity restriction for women who are at risk for preterm birth. Please take a moment to share your ideas. *Answer the questions as if you were the person most responsible for this woman's care even if you would usually transfer care to someone else.*

Instructions

Please complete this questionnaire by answering the questions in the space provided and return it via mail in the accompanying pre-addressed, postage-paid envelope, or FAX it to us at **780-492-2589** *within one week of receipt.* Some space has been left for comments and we welcome your feedback. If you require more space when providing comments, please attach a separate sheet.

Please complete this questionnaire *ONLY* if you provide prenatal care.

If you do not provide prenatal care, please place an **X** in this box and return the questionnaire anyway. This will help us track our true response rate.

☐ I do **NOT** provide prenatal care for women

Return this survey in the pre-addressed, postage-paid envelope or
FAX your reply to the Population Research Laboratory at the University of Alberta
780-492-2589

Population Research Laboratory, Department of Sociology, 1-62 HM Tory Building, Edmonton, AB, T6G 2H4

1. In your own practice, on average how often do you encounter a pregnant woman who could be at risk of preterm birth for ***ANY*** reason (e.g. previous preterm birth; multiple pregnancy; any signs and symptoms such as contractions or backache or fluid loss; shortened cervical length; positive fetal fibronectin test; or, lifestyle or social risk factors)?

   1. ☐ Daily
   2. ☐ Weekly
   3. ☐ Monthly
   4. ☐ 2-3 times/year
   5. ☐ Yearly

2. Overall, how would you rate the ***effectiveness*** of bed rest and activity restriction in ***preventing*** preterm birth?

BEDREST	**ACTIVITY RESTRICTION**
1. ☐ Excellent	1. ☐ Excellent
2. ☐ Very Good	2. ☐ Very Good
3. ☐ Good	3. ☐ Good
4. ☐ Fair	4. ☐ Fair
5. ☐ Poor	5. ☐ Poor

3. Do you **generally** recommend/encourage ***bed rest*** either in hospital **OR** at home as part of the therapy for women at risk of preterm birth?

In HOSPITAL	**AT HOME**
1. ☐ Yes	1. ☐ Yes
2. ☐ No	2. ☐ No

If you answered **NO** to **both** questions, **SKIP** to question # 10

If you answered **YES** to **either** question, **CONTINUE** on with question # 4

4. On a scale of 1 (not at all important) to 5 (extremely important), indicate the weight you place on each of the following considerations before recommending bed rest to women at risk for preterm birth (**CIRCLE** the corresponding number):

	Not at all important	**Somewhat important**	**Important**	**Very important**	**Extremely important**
Whether she can afford to be away from work	1	2	3	4	5
Whether she has help at home	1	2	3	4	5
Number of other children at home	1	2	3	4	5
Her likelihood of compliance	1	2	3	4	5
The side effects of bed rest	1	2	3	4	5
Her social support network	1	2	3	4	5

Comments: -

_____

_____

_____

5. When you recommend that women go on bed rest/activity restriction during pregnancy for signs/symptoms of preterm labour, ***how much of the time do you feel they follow your recommendation***? **CIRCLE** the most accurate response in each section.

Level of Activity	**Not at all**	**Sometimes**	**Most of the time**	**All of the time**
Strict bed rest – no getting up to the bathroom	1	2	3	4
Modified bed rest – may get up to the bathroom	1	2	3	4
Reduced activity	1	2	3	4

6. ***CIRCLE*** the number that corresponds to your degree of concern about these potential side effects of bed rest during pregnancy.

Side Effect	Not at all concerned	Somewhat concerned	Concerned	Very concerned	Extremely concerned	Not aware of this side effect
Muscle atrophy	1	2	3	4	5	6
Change in bone mass	1	2	3	4	5	6
Cardiovascular deconditioning	1	2	3	4	5	6
Fatigue	1	2	3	4	5	6
Weight loss	1	2	3	4	5	6
Deep vein thrombosis	1	2	3	4	5	6
Stress	1	2	3	4	5	6
Depression	1	2	3	4	5	6
Sleep disturbances	1	2	3	4	5	6
Economic problems	1	2	3	4	5	6

A. Do you ***routinely*** recommend any sort of exercise program for women on any degree of bed rest?

☐ Yes (specify)

_____

_____

☐ No

B. Do you ***routinely*** recommend any sort of social support for women on any degree of bed rest?

☐ Yes (specify)

_____

_____

☐ No

7. If you saw a woman at each of the following gestational ages with the clinical situations provided, **CIRCLE** yes (Y) or no (N) to indicate whether or not you would ask her to go on bed rest.

Clinical Situation	24 weeks		28 weeks		32 weeks	
A previous preterm birth at 26 weeks gestation but has no signs or symptoms of preterm labour now.	Y	N	Y	N	Y	N
A history of prelabour rupture of membranes in 2 previous pregnancies at 28 and 32 weeks – no cervical changes or contractions now.	Y	N	Y	N	Y	N
Twin pregnancy – no complications.	Y	N	Y	N	Y	N
Twin pregnancy with increased uterine activity but a long, closed cervix.	Y	N	Y	N	Y	N
Twin pregnancy with evidence of cervical change, but no contractions.	Y	N	Y	N	Y	N
Singleton pregnancy with evidence of cervical change, but no contractions.	Y	N	Y	N	Y	N
Feeling very stressed at work, occasional contractions, no cervical changes, and no history of preterm birth.	Y	N	Y	N	Y	N

Comments:

_____

_____

_____

8. In the following 3 clinical scenarios, ***decide*** whether you would ask a woman to restrict her activity, and if so, the degree of restriction you would suggest

Scenario 8A

A woman had a previous preterm birth at 31 weeks gestation. Presently she is at 28 weeks gestation and is in for a routine prenatal visit. Until now, there have been no pregnancy complications. She states she has been feeling some occasional contractions but has no other symptoms. She works in an office that she feels is a moderately stressful environment. She has a stable family environment and good support. You book a follow-up appointment and schedule an ultrasound.

☐ I would **NOT** recommend activity restriction (***go to Scenario 8B.***)

☐ I **WOULD** recommend restricting one or more of the following activities (**CHECK ALL** that apply from the list below)

	STOP DOING	***REDUCE***	***NOT USUALLY ADDRESSED***
Working outside the home	☐	☐	☐
Work at home (home office)	☐	☐	☐
Child care responsibilities	☐	☐	☐
Household tasks (laundry, cleaning)	☐	☐	☐
Meal preparation	☐	☐	☐
Prolonged standing (greater than 2 hrs.)	☐	☐	☐
Walking around outside	☐	☐	☐
Driving the car	☐	☐	☐
Sexual activity	☐	☐	☐

In this clinical situation, I would also generally recommend (**CHECK one**):

☐ Rest for 1-2 hours on couch/bed 2 to 3 times per day

☐ Rest for the majority of time on couch/bed except to go to the bathroom

☐ Strict bed rest - not getting up to the bathroom

☐ Other (specify)

_____

_____

For how long would you ask her to restrict her activity (**CHECK ALL** that apply):

- ☐ Until the ultrasound report is available
- ☐ Until she stops contracting
- ☐ Until she feels less stressed
- ☐ Until 36-37 weeks
- ☐ Other (specify)

_____

Scenario 8B

A woman is pregnant for the first time with twins. She is currently 26 weeks gestation. She is admitted to the hospital with contractions. The cervical length by ultrasound has shortened from 25 mm to 10mm. Fetal growth and biophysical parameters are normal. If everything stays stable for a few more days she will be discharged home. She asks you what you would recommend in terms of activity when at home.

☐ I would **NOT** recommend activity restriction (***go to Scenario 8C***)

☐ I **WOULD** recommend restricting one or more of the following activities (**CHECK ALL** that apply from the list below)

	STOP DOING	***REDUCE***	***NOT USUALLY ADDRESSED***
Working outside the home	☐	☐	☐
Work at home (home office)	☐	☐	☐
Household tasks (laundry, cleaning)	☐	☐	☐
Meal preparation	☐	☐	☐
Prolonged standing (greater than 2 hrs.)	☐	☐	☐
Walking around outside	☐	☐	☐
Driving the car	☐	☐	☐
Sexual activity	☐	☐	☐

In this clinical situation, I would generally recommend (**CHECK one**):

- ☐ Rest for 1-2 hours on couch/bed 2 to 3 times per day
- ☐ Rest for the majority of time on couch/bed except to go to the bathroom
- ☐ Strict bed rest - not getting up to the bathroom
- ☐ Other (specify)

_____

_____

For how long would you ask her to restrict her activity (**CHECK ALL** that apply):

- ☐ Until she delivers
- ☐ Until she is stable at home for a week
- ☐ Until 36-37 weeks
- ☐ Other (specify)

_____

_____

Scenario 8C

A primigravid woman with no pregnancy complications at 30 weeks gestation complains of regular tightenings and back pain for the last couple of days. When you see her in the office you can palpate contractions. When you send her for ultrasound, the cervical length is normal

☐ I would **NOT** recommend activity restriction (***go to Question 9.***)

☐ I **WOULD** recommend restricting one or more of the following activities (**CHECK ALL** that apply from the list below)

	STOP DOING	*REDUCE*	*NOT USUALLY ADDRESSED*
Working outside the home	☐	☐	☐
Work at home (home office)	☐	☐	☐
Household tasks (laundry, cleaning)	☐	☐	☐
Meal preparation	☐	☐	☐
Prolonged standing (greater than 2 hrs.)	☐	☐	☐
Walking around outside	☐	☐	☐
Driving the car	☐	☐	☐
Sexual activity	☐	☐	☐

In this clinical situation, I would generally recommend (**CHECK one**):

☐ Rest for 1-2 hours on couch/bed 2 to 3 times per day

☐ Rest for the majority of time on couch/bed except to go to the bathroom

☐ Strict bed rest - not getting up to the bathroom

☐ Other: (specify)

_____

_____

For how long would you ask her to restrict her activity (**CHECK ALL** that apply):

☐ Until she delivers

☐ Until she is stable at home for a week

☐ Until 36-37 weeks

☐ Other (specify)

_____

_____

9. The following validated scale measures your degree of comfort with a particular treatment decision you have made. Please answer the following questions ***based on the last woman to whom you recommended bed rest as a therapy for threatened preterm birth***: **CIRCLE** the most accurate response in each section.

Statement	Strongly Agree	Agree	Undecided	Disagree	Strongly disagree
a. The decision to recommend bed rest was hard to make.	1	2	3	4	5
b. I was unsure whether bed rest would really be best for this woman.	1	2	3	4	5
c. It was clear that bed rest would be best for this woman.	1	2	3	4	5
d. When making the decision, I felt I did not know enough about treatment alternatives, although the information is available in the literature.	1	2	3	4	5
e. I had trouble making the decision because important information on bed rest is either unknown or not readily available in the literature	1	2	3	4	5
f. When I made the decision, it was hard to decide if the benefits of bed rest/activity restriction were more important that the risks or vice versa.	1	2	3	4	5
g. It was easy to identify all the considerations that affect the decision to recommend bed rest/activity restriction.	1	2	3	4	5
h. I fully understood the patient's views regarding the important issues in making this decision.	1	2	3	4	5
i. I believed that the patient fully understood the risks and benefits of bed rest/activity restriction that I recommended.	1	2	3	4	5
j. I believed that the patient would comply with the bed rest/activity restriction regimen I recommended.	1	2	3	4	5
k. I was satisfied with the decision that was made.	1	2	3	4	5

1. I was satisfied that the process used to make the decision for bed rest/activity restriction was as good as it could be.	1	2	3	4	5

General Information

10. Does your hospital use fetal fibronectin testing to help determine if women in suspected preterm labour should be admitted?

1. ☐ Yes
2. ☐ No
3. ☐ I don't know

11. Does the place where you work/hospital/health region have any clinical practice guidelines about the use of bed rest for women at risk of preterm birth?

1. ☐ Yes
2. ☐ No
3. ☐ I don't know

12. What type of care provider are you?

1. ☐ Obstetrician
2. ☐ Family physician
3. ☐ Midwife

13. Your age? ☐☐ years

14. How many years have you been providing maternity care? ☐☐ years

15. Your gender?

1. ☐ Male
2. ☐ Female

16. How would you describe the location where you practice ***most of the time***? **(CHECK one)**

1. ☐ Urban/suburban
2. ☐ Small town
3. ☐ Rural
4. ☐ Isolated/remote

17. How would you describe the practice setting where you spend ***most of your time***, a: **(CHECK one)**

1. ☐ Teaching hospital
2. ☐ Community hospital
3. ☐ Not associated with a hospital
4. ☐ Other (please specify):

_____

18. Would you encourage your patients/clients to participate in any of the following types of studies about bed rest in pregnancy? (**Check** all that apply)

☐ A randomized controlled trial to evaluate the usefulness of bed rest
☐ Studies of the physiological side effects of bed rest
☐ Studies of the psychosocial side effects of bed rest
☐ Studies of the newborns of women who have been on bed rest
☐ Other - what type of research would you like to see completed?

_____

_____

Is there anything else you would like to tell us about the use of bed rest/activity restriction for women at risk of preterm birth?

_____

_____

_____

_____

Thank You – Your Input is Valuable!

Return this survey in the pre-addressed, postage-paid envelope or FAX your reply to the Population Research Laboratory at the University of Alberta: **780-492-2589**

Code #

UNIVERSITY OF ALBERTA

Appendix G – French Survey

Cote n°

L'utilisation du repos au lit ou des limitations d'activité pour les femmes risquant d'accoucher prématurément

Introduction

Nous cherchons à savoir comment souvent et dans quelles circonstances les médecins et les sages-femmes recommandent ou ordonnent le repos au lit ou d'autres formes de limitations d'activité pour les femmes qui risquent d'accoucher prématurément. Veuillez prendre quelques moments pour nous faire part de vos idées. *Répondez aux questions comme si la responsabilité principale des soins vous revenait, même si, en temps normal, vous les confieriez à quelqu'un d'autre.*

Marche à suivre

Veuillez répondre aux questions dans les cases ou espaces prévus. Ensuite, mettez le questionnaire à la poste dans l'enveloppe-réponse pré-affranchie, ou faites-le parvenir par télécopieur (780-492-2589), ***et ce dans les sept jours après l'avoir reçu.*** Nous avons en outre prévu de l'espace pour vos commentaires, et c'est avec plaisir que nous les lirons. Si vous avez besoin plus d'espace, suffit de joindre une feuille supplémentaire.

Ne remplissez le questionnaire que *si vous fournissez des soins prénatals*.

Si vous n'offrez pas de soins prénatals, inscrivez un X dans la case ci-dessous
et renvoyez tout de même le questionnaire.
Nous pourrons ainsi déterminer le taux de réponse véritable.

☐ Je NE FOURNIS PAS de soins prénatals aux femmes.

Retournez le questionnaire dans l'enveloppe-réponse pré-affranchie,
ou télécopiez-le au **780-492-2589**
(Population Research Laboratory, University of Alberta)

Population Research Laboratory, Department of Sociology, 1-62 HM Tory Building, Edmonton, AB, T6G 2H4

1. Dans votre propre pratique, comment souvent en moyenne rencontrez-vous des femmes à risque d'accouchement prématuré, ***peu importe la raison*** (p.ex., accouchement prématuré antérieur, grossesse multiple; contractions, maux de dos, pertes, fuites ou autres symptômes; effacement du col, résultat positif pour la fibronectine fétale; facteurs de risque d'ordre social ou liés au mode de vie)?

   1. ☐ Chaque jour
   2. ☐ Chaque semaine
   3. ☐ Chaque mois
   4. ☐ 2-3 fois par année
   5. ☐ Chaque année

2. Dans l'ensemble, évaluez ***l'efficacité*** du repos au lit et des limitations d'activité dans la ***prévention des accouchements prématurés.***

REPOS AU LIT	**LIMITATIONS D'ACTIVITÉ**
1. ☐ Excellent	1. ☐ Excellent
2. ☐ Très bon	2. ☐ Très bon
3. ☐ Bon	3. ☐ Bon
4. ☐ Moyen	4. ☐ Moyen
5. ☐ Faible	5. ☐ Faible

3. **Généralement**, est-ce que vous recommandez/encouragez ***le repos au lit*** à l'hôpital OU à domicile comme composante de la thérapie pour les femmes risquant d'accoucher prématurément?

À L'HÔPITAL	**À DOMICILE**
1. ☐ Oui	1. ☐ Oui
2. ☐ Non	2. ☐ Non

Si vous avez répondu NON aux **deux** questions, PASSEZ à la question n° 10.

Si vous avez répondu OUI à l'une ou l'autre des deux questions, enchaînez avec la question

4. D'après l'échelle ci-dessous (1-aucunement important; 5-extrêmement important), indiquez l'importance que vous accordez à chacun des facteurs suivants avant de recommander le repos au lit aux femmes risquant d'accoucher prématurément (**encerclez** le chiffre applicable).

	Aucunement important	**Assez important**	**Important**	**Très important**	**Extrêmement important**
Peut-elle se permettre une absence au travail?	1	2	3	4	5
A-t-elle de l'aide à la maison?	1	2	3	4	5
Combien d'autres enfants à la maison?	1	2	3	4	5
Dans quelle mesure va-t-elle accepter de le faire?	1	2	3	4	5
Les effets secondaires du repos au lit	1	2	3	4	5
Son réseau de soutien social	1	2	3	4	5

Commentaires:

_____

_____

5. Lorsque vous recommandez le repos au lit ou les limitations d'activité à cause de signes ou symptômes de travail prématuré, dans quelle mesure, selon vous, est-ce que les femmes suivent votre recommandation? **Encerclez** la réponse qui convient le mieux.

Niveau d'activité recommandé	**Pas du tout**	**Parfois**	**La plupart du temps**	**Tout le temps**
Repos complet au lit – ne pas se lever pour la salle de bain	1	2	3	4
Repos partiel au lit—peut se lever pour la salle de bain	1	2	3	4
Réduction de l'activité	1	2	3	4

6. ***ENCERCLEZ*** le chiffre qui reflète dans quelle mesure ces effets secondaires possibles du repos au lit pendant la grossesse vous préoccupent.

Effet secondaire	Pas du tout préoccupant	Un peu préoccupant	Préoccupant	Très préoccupant	Extrêmement préoccupant	Pas au courant de cet effet
Atrophie musculaire	1	2	3	4	5	6
Changement à la masse osseuse	1	2	3	4	5	6
Baisse de capacité cardiovasculaire	1	2	3	4	5	6
Fatigue	1	2	3	4	5	6
Perte de poids	1	2	3	4	5	6
Thrombose veineuse profonde	1	2	3	4	5	6
Stress	1	2	3	4	5	6
Dépression	1	2	3	4	5	6
Trouble du sommeil	1	2	3	4	5	6
Problèmes économiques	1	2	3	4	5	6

A. Recommandez-vous ***systématiquement*** un régime d'exercice quelconque pendant tout repos au lit?

☐ Oui (préciser)

_____

_____

☐ Non

B. Recommandez-vous ***systématiquement*** un soutien social quelconque pendant tout repos au lit?

☐ Oui (préciser)

_____

_____

☐ Non

7. Pour chaque combinaison « situation clinique / âge gestationnel », indiquez si vous proposeriez le repos au lit ou non (**ENCERCLEZ** « **O** » pour Oui, et « **N** » pour Non).

Situation clinique	**24 semaines**		**28 semaines**		**32 semaines**	
Naissance prématurée antérieure, à 26 semaines, mais aucun signe de travail prématuré actuellement	O	N	O	N	O	N
Antécédents de rupture prématurée des membranes, à 28 et 32 semaines, lors des deux grossesses antérieures—col inchangé et aucune contraction à présent	O	N	O	N	O	N
Enceinte de jumeaux (grossesse gémellaire) – aucune complication	O	N	O	N	O	N
Grossesse gémellaire, avec augmentation d'activité utérine, mais col long et fermé	O	N	O	N	O	N
Enceinte de jumeaux, avec changement au col, mais aucune contraction	O	N	O	N	O	N
Grossesse simple, avec changement au col, mais aucune contraction	O	N	O	N	O	N
Situation très stressante au travail, contractions occasionnelles, col inchangé, aucun accouchement prématuré par le passé	O	N	O	N	O	N

Commentaires :

_____

_____

_____

8. Pour les trois situations cliniques ci-dessous, décidez si vous recommanderiez des limitations d'activité et, si oui, le degré de limitation que vous proposeriez.

Situation 8A

La femme enceinte a eu un accouchement prématuré par le passé, à 31 semaines de gestation. Elle en est à sa 28e semaine et vient pour son examen prénatal régulier. Jusqu'ici, la grossesse se déroule sans complications. Elle dit avoir des contractions à l'occasion, mais aucun autre symptôme. Elle travaille dans un bureau qui, selon elle, est moyennement stressant. D'autre part, la femme a une vie de famille stable et jouit d'un bon soutien. Vous fixez un rendez-vous de suivi et réservez une échographie.

☐ Je ne recommanderais **PAS de** limitations d'activité (***passez à la question 8B***).

☐ Je recommanderais des limitations pour au moins une des activités ci-dessous (**COCHEZ toutes les réponses applicables):**

↓	*Cesser*	*Réduire*	**Non considéré habituellement**
Travail à l'extérieur de la maison	☐	☐	☐
Travail à domicile (bureau de maison)	☐	☐	☐
Soin ou garde d'enfants	☐	☐	☐
Tâches ménagères (lessive, nettoyage)	☐	☐	☐
Préparation de repas	☐	☐	☐
Position debout prolongée (plus de 2 hres)	☐	☐	☐
Marcher dehors un peu	☐	☐	☐
Conduite automobile	☐	☐	☐
Activité sexuelle	☐	☐	☐

Dans ce cas, je recommanderais en outre, de façon générale (**COCHEZ UNE OPTION**) :

☐ Repos au lit/sofa pour 1-2 heures, 2 ou 3 fois par jour

☐ Repos au lit/sofa la plupart du temps, sauf pour aller à la salle de bain

☐ Repos au lit complet—pas de salle de bain

☐ Autre (précisez)

_____

_____

Quelle durée proposeriez-vous pour les limitations d'activité (**cochez** toutes les réponses applicables)?

- ☐ Jusqu'à ce qu'on reçoive le rapport de l'échographie
- ☐ Jusqu'à ce que les contractions cessent
- ☐ Jusqu'à ce que son stress soit réduit
- ☐ Jusqu'à 36-37 semaines de gestation
- ☐ Autre (précisez)

_____

Situation 8B

Une femme en est à sa première grossesse, et attend des jumeaux. Elle est à 26 semaines de gestation. Elle se fait hospitaliser en raison de contractions. Le col, selon l'échographie, est passé de 25 mm à 10 mm. La croissance foetale et les paramètres biophysiques sont normaux. Si sa situation demeure stable pour quelques jours encore, elle obtiendra son congé. Elle vous demande une recommandation quant à son niveau d'activité une fois rentrée chez elle.

☐ Je ne recommanderais **PAS de** limitations d'activité (***passez à la question 8C***).

☐ Je recommanderais des limitations pour au moins une des activités ci-dessous (**COCHEZ toutes les réponses applicables):**

↓	*Cesser*	*Réduire*	**Non considéré habituellement**
Travail à l'extérieur de la maison	☐	☐	☐
Travail à domicile (bureau de maison)	☐	☐	☐
Tâches ménagères (lessive, nettoyage)	☐	☐	☐
Préparation de repas	☐	☐	☐
Position debout prolongée (plus de 2 hres)	☐	☐	☐
Marcher dehors un peu	☐	☐	☐
Conduite automobile	☐	☐	☐
Activité sexuelle	☐	☐	☐

Dans ce cas, je recommanderais en outre, de façon générale (**COCHEZ UNE OPTION**) :

☐ Repos au lit/sofa pour 1-2 heures, 2 ou 3 fois par jour

☐ Repos au lit/sofa la plupart du temps, sauf pour aller à la salle de bain

☐ Repos au lit complet—pas de salle de bain

☐ Autre (veuillez préciser)

_____

_____

Quelle durée proposeriez-vous pour la limitation d'activité (**cochez** toutes les réponses applicables)?

- ☐ Jusqu'à ce qu'elle accouche
- ☐ Jusqu'à ce que son état soit stable à la maison pendant une semaine
- ☐ Jusqu'à 36-37 semaines de gestation
- ☐ Autre (veuillez préciser)

_____

_____

Situation 8C

Une primigeste à sa 30e semaine de gestation et sans complications de grossesse vous dit qu'elle a mal au dos et ressent des contractions/resserrements réguliers depuis deux jours. Pendant l'examen, vous palpez des contractions. Une échographie révèle que la longueur du col est normale.

☐ Je ne recommanderais **PAS de** limitations d'activité (***passez à la question 9***).

☐ Je recommanderais des limitations pour au moins une des activités ci-dessous (**COCHEZ toutes les réponses applicables):**

	Cesser	***Réduire***	**Non considéré habituellement**
Travail à l'extérieur de la maison	☐	☐	☐
Travail à domicile (bureau de maison)	☐	☐	☐
Tâches ménagères (lessive, nettoyage)	☐	☐	☐
Préparation de repas	☐	☐	☐
Position debout prolongée (plus de 2 hres)	☐	☐	☐
Marcher dehors un peu	☐	☐	☐
Conduite automobile	☐	☐	☐
Activité sexuelle	☐	☐	☐

Dans ce cas, je recommanderais en outre, de façon générale (**COCHEZ UNE OPTION**) :

☐ Repos au lit/sofa pour 1-2 heures, 2 ou 3 fois par jour

☐ Repos au lit/sofa la plupart du temps, sauf pour aller à la salle de bain

☐ Repos au lit complet—pas de salle de bain

☐ Autre (veuillez préciser)

_____

_____

Quelle durée proposeriez-vous pour la limitation d'activité (**cochez** toutes les réponses applicables)?

- ☐ Jusqu'à ce qu'elle accouche
- ☐ Jusqu'à ce que son état soit stable à la maison pendant une semaine
- ☐ Jusqu'à 36-37 semaines de gestation
- ☐ Autre (veuillez préciser)

_____

_____

9. L'échelle validée ci-dessous indique votre assurance à l'égard d'une décision que vous avez prise en matière de soins. Répondez à chaque énoncé ***selon la dernière femme à qui vous avez recommandé le repos au lit comme thérapie contre un risque d'accouchement prématuré.*** ENCERCLEZ la réponse qui convient le mieux dans chaque cas.

Énoncé	Fortement d'accord	D'accord	Indécis/e	Pas d'accord	Fortement en désaccord
a. J'ai eu du mal à décider de recommander le repos au lit.	1	2	3	4	5
b. Je ne savais pas vraiment si le repos au lit serait la meilleure consigne pour la femme en question.	1	2	3	4	5
c. Le repos au lit était clairement la meilleure consigne dans ce cas.	1	2	3	4	5
d. Dans ma prise de décision, j'avais l'impression de ne pas en savoir assez sur les autres options, même si elles sont bien documentées.	1	2	3	4	5
e. J'ai eu du mal à décider soit parce qu'il manque de l'information clé sur le repos au lit, soit parce cette information n'est pas bien documentée.	1	2	3	4	5
f. Dans ma décision, j'ai eu du mal à déterminer si les avantages du repos au lit ou des limitations d'activité l'emportaient sur les risques, ou vice versa.	1	2	3	4	5
g. J'ai pu facilement reconnaître les facteurs qui jouent dans la décision de recommander le repos au lit/les limitations d'activité.	1	2	3	4	5
h. Je comprenais parfaitement l'avis de la patiente à l'égard des questions clés liées à la décision.	1	2	3	4	5

i. Je pense que la patiente comprenais très bien les avantages et les risques du repos au lit/des limitations d'activité que je recommandais.	1	2	3	4	5
j. Je croyais que la patiente se conformerait au régime de repos/limitations d'activité recommandé.	1	2	3	4	5
k. J'étais satisfait/e de ma décision.	1	2	3	4	5
l. Je savais que nous avions employé le meilleur processus de décision possible.	1	2	3	4	5

Renseignements généraux

10. Est-ce que votre hôpital utilise des analyses de fibronectine fétale lorsqu'il faut décider d'hospitaliser ou non une femme qui semble être en travail prématuré?

    1. ☐ Oui
    2. ☐ Non
    3. ☐ Je ne sais pas

11. Existe-t-il dans votre lieu de travail/hôpital/région des lignes directrices cliniques sur l'utilisation du repos au lit pour les femmes risquant d'accoucher prématurément?

    1. ☐ Oui
    2. ☐ Non
    3. ☐ Je ne sais pas

12. Quelle profession de la santé exercez-vous?

    1. ☐ Obstétricienne / Obstétricien
    2. ☐ Médecin de famille
    3. ☐ Sage-femme

13. Quel âge avez-vous? ☐☐ ans

14. Depuis combien d'années offrez-vous des soins de maternité? ☐☐

15. Votre sexe?

1. ☐ Homme
2. ☐ Femme

16. Comment décririez-vous l'endroit où ***la plupart de votre pratique*** se fait? **(COCHEZ une réponse)**

1. ☐ Urbain/banlieue
2. ☐ Petite ville
3. ☐ Rural
4. ☐ Isolé/éloigné

17. Dans quel milieu de travail consacrez-vous ***la plupart de votre temps?*** **(COCHEZ une réponse)**

1. ☐ Hôpital d'enseignement
2. ☐ Hôpital communautaire
3. ☐ Milieu non hospitalier
4. ☐ Autre (veuillez préciser)

_____

18. Encourageriez-vous vos patientes/clientes à participer dans l'une ou l'autre des études ci-dessous sur le repos au lit pendant la grossesse? **(Cochez toutes les réponses applicables)**

☐ Essai clinique comparé et pour évaluer l'utilité du repos au lit
☐ Études sur les effets secondaires physiologiques du repos au lit
☐ Études sur les effets secondaires psychosociaux du repos au lit
☐ Études sur les nouveaux-nés de femmes qui ont eu du repos au lit
☐ Autres—Quel genre de recherche convient-il d'entreprendre, selon vous?

_____

_____

Ajoutez ici tout autre commentaire que vous avez à propos du repos au lit/des limitations d'activité pour les femmes risquant d'accoucher prématurément:

_____

_____

Merci infiniment de votre précieuse collaboration!

Cote n°

Renvoyez le questionnaire dans l'enveloppe-réponse pré-affranchie, ou par télécopieur au **780-492-2589** (Population Research Laboratory, University of Alberta).

Appendix H – Reminder Post-Card
English and French

March 18, 2005	Le 18 mars 2005
Last week we sent you a questionnaire about bed rest as a therapy in pregnancy. If you have already completed and returned the questionnaire, please accept our sincere thanks. If not, please do so today. We are really grateful for your help because it is only by asking people like you to share your experiences that we can understand more about the use of bed rest in pregnancy If you did not receive a questionnaire, or it was misplaced, please call Rosanna Shih at 780-492-4659 ext. 223 and we will get another one in the mail to you today.	La semaine dernière, nous vous avons envoyé un questionnaire portant sur le repos au lit comme thérapie pendant la grossesse. Si vous avez déjà rempli et renvoyé le questionnaire, nous vous en remercions chaleureusement. Sinon, veuillez le faire dès aujourd'hui, car seul un aperçu complet d'expériences professionnelles comme les vôtres nous aidera à comprendre davantage l'emploi du repos au lit pendant la grossesse. Nous vous en serions très reconnaissants. Si vous n'avez pas reçu le questionnaire, ou s'il a été égaré, veuillez communiquer avec Rosanna Shih au 780-492-4659 poste 223 pour qu'elle puisse vous en poster un nouvel exemplaire aujourd'hui même.
UNIVERSITY OF ALBERTA Ann E. Sprague PhD Candidate Faculty of Nursing University of Alberta	
The Use of Bed Rest or Activity Restriction in **Women at Risk of Preterm Birth** L'utilisation du repos au lit ou des limitations d'activité pour les femmes risquant d'accoucher prématurément	*A Friendly Reminder to:*

Appendix I – Second Mailing Contact Letter English and French

March 30, 2005

Dear* :

About three weeks we asked you to complete a survey about your experiences with prescribing/recommending bed rest/activity restriction as a therapy during pregnancy. We are looking forward to your response.

The comments of people who have already responded include a variety of reasons why people recommend or don't recommend this type of activity restriction. We think the results are going to be very important in planning further studies. We are writing again because of the ***importance that your participation*** in this survey has for generating accurate results. The more people we hear from, the more confidence we will have that our findings are truly representative.

A few people have indicated that they should not have received the questionnaire because they are no longer providing prenatal care. If this situation applies to you, please let us know by ticking the box on the cover of the questionnaire and returning it in the enclosed envelope so that we can delete your name from the mailing list.

As part of our procedure, we assigned an identification number to each person in our sample. It is printed on the front and back cover of the questionnaire so that we can check your name off of the mailing list when it is returned. The list of names is kept by the Population Research Laboratory at the University of Alberta. Individual names can never be connected to the results of this study in any way. Protecting your confidentiality is very important to us and is closely monitored by the Health Research Ethics Board at the University of Alberta.

We hope that you will complete the questionnaire soon, but if for any reason you prefer not to answer it, please let us know by returning a note on the questionnaire in the enclosed stamped envelope.

Sincerely,

Ms. Ann Sprague – PhD Candidate, Faculty of Nursing, University of Alberta and Coordinator, Perinatal Partnership Program of Eastern and Southeastern Ontario (PPPESO)

On behalf of the research team

Dr. Beverley O'Brien – Professor, Faculty of Nursing, University of Alberta
Dr. Christine Newburn-Cook – Associate Professor, Faculty of Nursing, University of Alberta
Dr. Carl Nimrod – Professor and Chair, Department of Obstetrics and Gynecology, University of Ottawa
Dr. Maureen Heaman – Associate Professor, Faculty of Nursing, University of Manitoba

*** English letters were addressed to Dear Dr. ..... and the midwifery letters were addressed to Dear Ms.....**

Le 30 mars 2005

Docteure*,

Il y a environ trois semaines, nous vous avons demandé de remplir un questionnaire traitant de vos expériences dans la recommandation ou l'ordonnance de repos au lit ou d'autres limitations d'activité comme thérapie pendant la grossesse. Nous avons bien hâte de recevoir vos réponses.

Les réponses jusqu'à présent comprennent une foule de raisons pour lesquelles on recommande ou non ce genre de limitation. En bout ligne, les résultats joueront un rôle clé dans la mise au point d'autres études. Nous vous écrivons à nouveau puisque votre participation est pour beaucoup dans la production de résultats fiables. Plus nous recevons de réponses, plus nous pourrons dire que les conclusions reflètent la réalité.

Certaines personnes nous ont dit que le questionnaire ne les concernait pas puisqu'elles n'offrent plus des soins prénatals. Si c'est votre cas, veuillez nous l'indiquer en cochant la case à la page couverture du questionnaire; renvoyez-nous ensuite le questionnaire dans l'enveloppe pré-affranchie et nous rayerons votre nom de la liste d'envoi.

Dans notre marche à suivre, nous avons affecté une cote d'identité à chacune des personnes de notre échantillonnage. La cote paraît sur les couvertures avant et arrière du questionnaire pour que nous puissions enlever votre nom de la liste d'envoi une fois votre questionnaire retourné. La liste de noms est conservée au Population Research Laboratory de la University of Alberta. Cela dit, il est impossible de lier votre nom aux résultats de l'étude. La protection de votre confidentialité est primordiale, et le Health Research Ethics Board de la University of Alberta la surveille rigoureusement.

Nous espérons bientôt recevoir votre questionnaire rempli, mais si vous préférez ne pas y répondre, veuillez nous en faire part sur le questionnaire et nous renvoyer celui-ci dans l'enveloppe pré-affranchie.

Sincères remerciements et salutations,

Ann Sprague, **candidate au doctorat, Faculty of Nursing, University of Alberta et coordonnatrice, Programme de partenariat périnatal de l'est et du sud-est de l'Ontario (PPPESO)**

Au nom de l'équipe de recherche

Beverley O'Brien, professeure, Faculty of Nursing, University of Alberta
Christine Newburn-Cook, professeure agrégée, Faculty of Nursing, University of Alberta
Carl Nimrod, professeur et directeur, Département d'obstétrique et de gynécologie, Université d'Ottawa
Maureen Heaman, professeure agrégée, Faculty of Nursing, University of Manitoba

* For the French midwives, the salutation was Madame. For the French male physicians, the salutation was Docteur

Appendix J – Final Mailing
English and French

April 12, 2005

Dear* :

During the last two months we mailed you several invitations to participate in an important research study that we are conducting about the use of bed rest as a therapy during pregnancy.

We want to learn more about how often and under what circumstances obstetricians, family physicians and midwives prescribe/recommend bed rest or activity restriction.

The study is drawing to a close, and this is the last contact that will be made with the sample of people who we think will provide us with valuable information.

We are sending this final contact because of our concern that people who have not responded may have different experiences than those who have. Hearing from everyone in our sample helps assure that the survey results will be as valid as possible.

We also want to assure you that your response to this study is voluntary, and if you prefer not to respond, that's fine. If you no longer provide prenatal care to pregnant women, and you feel we made a mistake including you in this study, please let us know by returning the first page of the questionnaire or the entire blank questionnaire. This would be very helpful.

Finally, we appreciate your willingness to consider our request as we conclude this effort to better understand the use of bed rest in pregnancy. Thank you very much.

Sincerely,

Ms. Ann Sprague – PhD Candidate, Faculty of Nursing, University of Alberta and Coordinator, Perinatal Partnership Program of Eastern and Southeastern Ontario (PPPESO)

On behalf of the research team

Dr. Beverley O'Brien – Professor, Faculty of Nursing, University of Alberta
Dr. Christine Newburn-Cook – Associate Professor, Faculty of Nursing, University of Alberta
Dr. Carl Nimrod – Professor and Chair, Department of Obstetrics and Gynecology, University of Ottawa
Dr. Maureen Heaman – Associate Professor, Faculty of Nursing, University of Manitoba

*** English letters were addressed to Dear Dr. ….. and the midwifery letters were addressed to Dear Ms……**

Le 12 avril 2005

Docteure*,

Il y a environ trois semaines, nous vous avons demandé de remplir un questionnaire traitant de vos expériences dans la recommandation ou l'ordonnance de repos au lit ou d'autres limitations d'activité comme thérapie pendant la grossesse. Nous avons bien hâte de recevoir vos réponses.

Les réponses jusqu'à présent comprennent une foule de raisons pour lesquelles on recommande ou non ce genre de limitation. En bout ligne, les résultats joueront un rôle clé dans la mise au point d'autres études. Nous vous écrivons à nouveau puisque votre participation est pour beaucoup dans la production de résultats fiables. Plus nous recevons de réponses, plus nous pourrons dire que les conclusions reflètent la réalité.

Certaines personnes nous ont dit que le questionnaire ne les concernait pas puisqu'elles n'offrent plus des soins prénatals. Si c'est votre cas, veuillez nous l'indiquer en cochant la case à la page couverture du questionnaire; renvoyez-nous ensuite le questionnaire dans l'enveloppe pré-affranchie et nous rayerons votre nom de la liste d'envoi.

Dans notre marche à suivre, nous avons affecté une cote d'identité à chacune des personnes de notre échantillonnage. La cote paraît sur les couvertures avant et arrière du questionnaire pour que nous puissions enlever votre nom de la liste d'envoi une fois votre questionnaire retourné. La liste de noms est conservée au Population Research Laboratory de la University of Alberta. Cela dit, il est impossible de lier votre nom aux résultats de l'étude. La protection de votre confidentialité est primordiale, et le Health Research Ethics Board de la University of Alberta la surveille rigoureusement.

Nous espérons bientôt recevoir votre questionnaire rempli, mais si vous préférez ne pas y répondre, veuillez nous en faire part sur le questionnaire et nous renvoyer celui-ci dans l'enveloppe pré-affranchie.

Sincères remerciements et salutations,

Ann Sprague, **candidate au doctorat, Faculty of Nursing, University of Alberta et coordonnatrice, Programme de partenariat périnatal de l'est et du sud-est de l'Ontario (PPPESO)**

Au nom de l'équipe de recherche

Beverley O'Brien, **professeure, Faculty of Nursing, University of Alberta**
Christine Newburn-Cook, **professeure agrégée, Faculty of Nursing, University of Alberta**
Carl Nimrod, **professeur et directeur, Département d'obstétrique et de gynécologie, Université d'Ottawa**
Maureen Heaman, professeure agrégée, Faculty of Nursing, University of Manitoba

* For the French midwives, the salutation was Madame. For the French male physicians, the salutation was Docteur

Appendix K – University of Alberta Health Research Board Ethics Approval

Health Research Ethics Board

212.27 Walter Mackenzie Centre
University of Alberta, Edmonton, Alberta T6G 2R7
p.780.492.9724
p.780.492.0459
p.780.492.0839
f.780.492.7303
ethics@med.ualberta.ca

ETHICS APPROVAL FORM

Date:	May 2004
Name of Applicant:	Dr. Bev O'Brien
Organization:	University of Alberta
Department:	Faculty of Nursing
Project Title:	**Activity levels for women at risk for preterm birth (PTB) - A survey of Canadian care providers**

The Health Research Ethics Board (HREB) has reviewed the protocol for this project and found it to be acceptable within the limitations of human experimentation.

The approval for the study as presented is valid for one year. It may be extended following completion of the yearly report form. Any proposed changes to the study must be submitted to the Health Research Ethics Board for approval. Written notification must be sent to the HREB when the project is complete or terminated.

Dr. Glenn Griener
Chair of the Health Research Ethics Board
(B: Health Research)

File number: B-090504

UNIVERSITY OF ALBERTA Capital Health CARITAS HEALTH GROUP