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Obstetrical Screening Practices of Nurse-Midwives and Nurse Practitioners

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OBSTETRICAL SCREENING PRACTICES OF NURSE–MIDWIVES AND NURSE PRACTITIONERS

by

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Dedication and Acknowledgement

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Abstract

With the continued growth in the numbers of nurse practitioners and certified nurse-midwives, more and more women will receive prenatal care from advanced practice nurses. The purpose of this research was to assess the routine screening practices of advance practice nurses providing prenatal care and to compare those practices with current guidelines. The study focused on five areas of prenatal screening: bacterial vaginosis, group B streptococcus, gestational diabetes, maternal serum markers, and fetal movement monitoring. The interaction model of client health behavior by Cheryl Cox, specifically professional-technical competencies, part of the client-professional element of the model, provided the theoretical framework for this study.

The sample was obtained from two major nursing organizations involved in prenatal care: the National Association of Nurse Practitioners in Women's Health and the American College of Nurse-Midwives. A random sample of 250 members from each organization was sent a postcard explaining the study and directing them to the online survey.

In four out of five screening areas, there was no significant difference in the screening practices of NPs and CNMs. Bacterial vaginosis was the only screening with a significant difference. There was inconsistency with what the advanced practice nurses state they do and current guidelines with respect to screening for group B streptococcus and maternal serum markers.

Chapter One: Introduction

According to the Centers for Disease Control (CDC) National Vital Statistics System, approximately 4,138,349 infants were born in 2005 (CDC, 2008). Prenatal care for these births is provided not only by physicians, but also by, advanced practice nurses, including nurse practitioners and certified nurse-midwives.

Every pregnant woman should receive quality prenatal care to assess and treat risks to both the mother and fetus. Early identification of high-risk pregnancies allows clinicians to provide appropriate care to decrease morbidity and mortality. "Women who receive early and regular prenatal care are more likely to have healthier infants" (American Academy of Pediatrics [AAP] & American College of Obstetricians and Gynecologists [ACOG], 2007, p. 87). All prenatal care providers should be qualified to provide appropriate education, risk assessment, and treatment to this population. Organizations such as the ACOG, the CDC, the American Diabetes Association (ADA) and the United States Preventive Services Task Force (USPSTF) provide guidelines for prenatal care which are based on extensive research and evidence based practice. These guidelines include recommended prenatal screening practices.

Some routine testing provided in prenatal care is generally accepted as appropriate care. These tests include hematocrit and hemoglobin levels, urinalysis, determination of blood group and Rh type, antibody screen, determination of immunity to rubella virus, syphilis screen, chlamydia screen, cervical cytology, human

immunodeficiency virus antibody testing, hepatitis testing, group B streptococcus screen, and maternal serum markers (AAP & ACOG, 2008). For some other screenings, including screening for bacterial vaginosis, gestational diabetes, and fetal movement monitoring, questions remain as to whether evidence supports these tests and monitoring in all pregnant women.

Advanced practice nurses (APNs) delivering care to pregnant women are qualified to provide appropriate education, risk assessment, and treatment to this population. Nurse practitioners (NPs) were first trained in the area of pediatrics when Loretta Ford and Dr. Henry Silver started the pediatric nurse practitioner program at the University of Colorado in 1965 in response to the need for primary care for children in urban and underserved areas (Pulcini & Wagner, 2002). Since then, nurse practitioner programs have evolved to include all types of specialties such as geriatrics, acute care, neonatal, psychiatric, women's health, and family practice, to name just a few. In addition, many NPs educated in areas such as adult health or primary care will actually practice in more specialized areas such as cardiac, dermatology, or obstetrics. These nurses are tasked with developing additional competencies in these specialized areas. Most states currently require NPs to have master's level education and national certification in order to practice. Currently there are more than 300 master's level NP programs (Bureau of Labor Statistics, 2007), and more than 140,000 NPs in the United States (Health Resources and Services Administration [HRSA], 2004).

Midwives have been in practice in the United States for many years. The first formal education of nurse-midwives in the United States began with the School for the Association for the Promotion and Standardization of Midwifery in 1932 and the Frontier

Graduate School of Midwifery in 1939 (Burst & Thompson, 2003). Midwives initially practiced in homes, mostly for women of low socioeconomic status. In 1953, midwives first started practice in university-affiliated hospitals, which opened the door to education within a university (Burst & Thompson, 2003). As of 2006, there were 39 accredited nurse-midwifery programs in the United States (Bureau of Labor Statistics, 2007) and more than 13,000 nurse-midwives (HRSA, 2004). Of these nurse-midwives, only 7,037 were actually employed as nurse-midwives (HRSA, 2004).

Currently, there is a lack of information regarding obstetrical practices of NPs and CNMs. As more nurses become advance practice nurses, and more clients seek care from advanced practice nurses, it will be important to show that advance practice nurses are providing quality prenatal screening for risk factors and complications in pregnancy.

Purpose

The purpose of this study was to assess routine obstetrical screening practices of NPs and CNMs who routinely provide prenatal care and to compare those practices with current guidelines. The five specific areas chosen as a focus were bacterial vaginosis, group B streptococcus, gestational diabetes mellitus, maternal serum markers, and fetal movement monitoring.

Theoretical Framework

The theoretical framework chosen for this study was the interaction model of client health behavior (IMCHB) by Cheryl Cox. The IMCHB has three major elements: client singularity, the client-provider relationship, and subsequent client health care behavior (Cox, 1982). Use of the model assumes that clients are both capable of and

competent to make choices about their health care behavior and advocates for maximum control by the client in making such choices, within their limitations (Cox, 1982).

Client singularity. Client singularity is composed of the client's background variables, motivation, appraisal of health care concerns, and the affective response to health care concerns. Each client has a unique combination of these variables, which should guide health care professionals in their approach and plan (Cox, 1982).
The background variables include demographic characteristics, financial resources, influence of client's social group, previous experiences with health care, environmental resources and availability of health care facilities. These are in constant interaction with each other to produce each client's unique health behavior (Cox, 1982).

The second aspect of client singularity, motivation, is defined by Cox (1982) as the "choice, desire, and the need for competency and self-determinism as causal factors in behavior" (p. 49). Motivation is preceded by background variables, cognitive appraisal and affective response. When clients are allowed to be active participants in their health care choices, this reinforces their motivation to continue the positive behavior.

Cognitive appraisal refers to the client's interpretation of their health, their choices and the relationship between them and the health care provider (Cox, 1982). Clients will act according to their perception of reality, which may or may not be the objective reality. Once again, a client's background variables will influence their cognitive appraisal.

The last element of client singularity is affective response to health concerns (Cox, 1982). Clients' behaviors are not only based on rational, cognitive thought, but also emotions. Both negative and positive emotions can affect future behaviors. If a client has

a negative experience during an exam, it may lead to an effective response of fear, thus preventing them from having that exam in the future. All four aspects of client singularity need to be assessed and addressed in order to provide a positive health care experience for the client.

Client-professional interaction. The client-professional interaction is the second element of the IMCHB model. It focuses on the "continuous reciprocal interaction between aspects of the client's singularity, the interaction, and the health care outcomes" (Cox, 1982, p. 51). There are four components within client-professional interaction: provision of health information, affective support, decisional control, and professional-technical competencies. Each of these components, along with the client's singularity and health care need, define the interaction between the client and health care professional.

Health information is necessary for positive change in health behaviors, but is not enough on its own (Cox, 1982). Information concerning the details of the problem as well as what can or cannot be done provide the client with knowledge necessary to make appropriate decisions, provided the information is not too great or too small. The client's relationship with the health care provider, perceived control over the situation, and client's singularity, will determine how the client processes and uses the provided information.

The second component of client-professional relationship is affective component, which refers to the client's level of emotional arousal. Depending on the client's singularity, the affective response could, interventions may need to first reduce the level of emotional arousal in order for any other intervention to be effective. To provide clients

with too much affective support, if that type of support is not needed, may also lead to patient dissatisfaction (Cox, 1982).

Decisional control is an important element since it "increases the client's sense of self-efficacy and facilitates commitment to health-relevant behaviors (Cox, 1982, p. 52). Decisional control is inter-related to the other elements of affective support and health information. A patient may be emotionally aroused to the extent that they may not be able to provide decisional control. If inaccurate or inappropriate levels of knowledge are provided, the client may not be able to provide decisional control. The goal is to allow the patient to have maximum decisional control as the situation warrants (Cox, 1982).

The last element, professional-technical competencies, is related to the other elements in that "the greater the client's need for technical skills from the provider, the less the need for decisional control" (Cox, 1982, p. 53). Depending on the client's health state, the need for affective and information will vary. In order to increase the clients' sense of self-determination, their own abilities should be brought into play as the need for technical intervention decreases (Cox, 1982).

Health outcomes. The last component of the IMCHB is health outcomes (Cox, 1982). Health outcomes are measured by health behaviors or a health state that results from that behavior. According to Cox (1982), health outcomes consist of "five distinctive variables: utilization of health care services, clinical health-status indicators, severity of recommended-care regimen, and satisfaction with care" (p.53). The variables are all useful depending on the purpose, and will vary in accordance with the objective of the study.

This study focuses on the client-professional interaction, specifically professional-technical competencies. In pregnancy, clients rely on health care providers to provide a high level of technical skills and monitoring to provide important information that may affect decisions made by the client. This study will focus on specific aspects of monitoring (screening) done by advance practice nurses.

Table 1.1
Interaction Model of Client Health Behavior as Used in the Present Study

Client singularity		Client-professional interaction	Health Outcomes
Demographic characteristics Social influence Previous health care experience Environmental resources	Intrinsic motivation Cognitive appraisal Affective response	Affective support Health information Decisional control Professional-Technical Competencies: **Prenatal Screening**	Utilization of health care services Clinical health status indicators Severity of health care problems Adherence to the recommended care regimen Satisfaction with care

Note. From "An interaction model of client health behavior: Theoretical prescription for nursing," by C.L. Cox, 1982, *Advances in Nursing Science, 5*(1), p. 47.

Chapter Two: Literature Review

The literature review will provide background information on the five areas of this study: bacterial vaginosis, group B streptococcus, gestational diabetes, maternal serum markers, and fetal movement monitoring. Screening recommendations from the CDC, USPSTF, ACOG, and the ADA will be presented, as well as appropriate information from current literature.

Bacterial Vaginosis

Bacterial vaginosis (BV) is a common infection in the female genital tract resulting from the overgrowth of normal flora, such as Gardnerella vaginalis, mycoplasmata, and anaerobes, and a reduction of hydrogen peroxide-producing lactobacillus (Nygren et al., 2008). Although many women with BV are asymptomatic, BV commonly presents with a thin white discharge (CDC, 2006). The diagnosis is made based on the presence of two of three signs: amine odor before or after the application of 10% KOH, the presence of clue cells on microscopic exam and a vaginal fluid pH greater than 4.5 (CDC, 2006).

BV in the general population is generally a benign condition, but has been associated with pelvic inflammatory disease, endometritis and vaginal cuff cellulitis after invasive procedures (CDC, 2006). However, in pregnant women, BV is associated with adverse outcomes including "premature rupture of membranes, preterm labor, preterm birth, intra-amniotic infection, and postpartum endometritis" (CDC, 2006, p. 51). The

prevalence rate of BV in pregnant women varies from 9% to 23%, but is not well studied in community settings (Nygren et al., 2008).

Two organizations, the CDC and USPSTF have made recommendations regarding BV screening and treatment (CDC, 2006; USPSTF, 2008). The differences in the recommendations are slight because the evidence is inconclusive. A 2007 Cochrane review concluded that, while there is sufficient evidence that BV is associated with an increased risk for preterm birth, there is still not enough evidence to conclude whether screening and treatment is beneficial in reducing poor perinatal outcomes (McDonald, Brocklehurst, & Gordon, 2007)

The CDC recommends screening for BV during the first prenatal visit and treatment of all symptomatic pregnant women (CDC, 2006). In women who have previously delivered a preterm infant and are at high risk for premature delivery, treatment of asymptomatic BV is recommended. The treatment of choice for BV is metronidazole 500 mg by mouth twice a day for seven days, or metronidazole 250 mg by mouth three times a day for seven days, or clindamycin 300 mg by mouth twice a day for seven days (CDC, 2006). The USPSTF, on the other hand, does not recommend for or against routine screening for BV in pregnancy, even those at high risk for preterm delivery, stating that there is insufficient evidence on the harms and benefits of screening and treatment (USPSTF, 2008).

BV screening can be done several ways. The gold standard for detecting BV is the gram stain, which allows the clinician to observe different gram negative and gram positive rods which are characteristic of BV (CDC, 2006). BV can also be diagnosed using clinical criteria, which requires three of the following symptoms:

1. Homogeneous, thin, white discharge that smoothly coats the vaginal walls
2. presence of clue cells on microscopic examination
3. pH of vaginal fluid >4.5
4. a fishy odor of vaginal discharge before or after addition of 10% KOH (i.e., the whiff test). (CDC, 2006)

Commercially available tests are also available for the diagnosis of BV which detect elevated pH and trimethylamine or prolineaminopeptidase (CDC, 2006).

Group B Streptococcus

Group B Streptococcus (GBS) is a gram positive bacteria that colonizes the vaginal-rectal area in 10-30% of pregnant women (Schrag, Forwitz, Fultz-Butts & Schuchat, 2002). Women who are colonized with GBS are at risk for post-partum infections such as urinary tract infection, amnionitis, endometritis, sepsis, and meningitis (Schrag et al., 2002). In newborns, GBS sepsis can be the result of vertical transmission from the mother during labor or delivery, nosocomial infection, or community-acquired infection. Infection in the newborn can cause sepsis, pneumonia, and meningitis (AAP & ACOG, 2007). Even with preventive strategies in place, "GBS disease remains a leading infectious cause of morbidity and mortality among newborns in the United States" (Schrag et al., 2002, p. 2). Both the CDC and ACOG recommend screening all pregnant women by vaginal and rectal cultures at 35-37 weeks gestation (AAP & ACOG, 2007; Schrag et al., 2002). (See table 2.1)

Table 2.1
Indications for Intrapartum Antibiotic Prophylaxis to Prevent Perinatal GBS Disease

Vaginal and rectal GBS screening cultures at 35-37 weeks of gestation for ALL pregnant women (unless patient had GBS bacteriuria during the current pregnancy or a previous infant with invasive GBS disease)

Intrapartum prophylaxis indicated	**Intrapartum prophylaxis not indicated**
·Previous infant with invasive GBS disease	·Previous pregnancy with a positive GBS screening culture (unless a culture was also positive during the current pregnancy)
·GBS bacteriuria during current pregnancy	·Planned cesarean delivery performed in the absence of labor or membrane rupture (regardless of maternal GBS culture status)
·Positive GBS screening culture during current pregnancy (unless a planned cesarean delivery, in the absence of labor or amniotic membrane rupture, is performed)	·Negative vaginal and rectal GBS screening culture result in late gestation during the current pregnancy, regardless of intrapartum risk factors
·Unknown GBS status (culture not done, incomplete, or results unknown) and any of the following:	
-Delivery at less than 37 weeks of gestation	
-Amniotic membrane rupture of 18 hours or greater	
-Intrapartum temperature at 100.4°F or greater (38.8°C or greater)	

Note. From *Guidelines for Perinatal Care* (6th ed.), by American Academy of Pediatrics and American College of Obstetricians and Gynecologists, 2007, p. 329.

Both CDC and ACOG use the same recommendations for intrapartum antimicrobial prophylaxis for GBS. The recommended regimen, provided the mother is not allergic to penicillin is Penicillin G, 5 million units intravenous (IV) initial dose, followed by 2.5 million units IV every four hours until delivery. An alternative regimen is 2 grams ampicillin IV initial dose, followed by 1 gram IV every four hours until

delivery. For women who are allergic to penicillin, recommendations are based on whether there is a high risk for anaphylaxis. Women who are not at high risk for anaphylaxis can receive cefazolin 2 grams IV initial dose, followed by 1 gram every eight hours until delivery. In women who are at high risk for anaphylaxis, the recommendations depend upon whether the GBS is susceptible to clindamycin and erythromycin or resistant. If the GBS is susceptible, then clindamycin 900 milligrams IV every eight hours until delivery or erythromycin 500 milligrams IV every six hours until delivery may be used. In patients with resistant GBS or if susceptibility is unknown, then vancomycin 1 gram IV every twelve hours until delivery should be used (Schrag et al., 2002; AAP & ACOG, 2007).

Gestational Diabetes

The American Diabetes Association (ADA) defines gestational diabetes mellitus (GDM) as "any degree of glucose intolerance with onset or first recognition during pregnancy" (ADA, 2008, p. 15). Depending on the population studied and diagnostic tests used, occurrence of GDM ranges from 1-14%, with an average of 7% in the general population (ADA, 2008).

The ADA (2008) and ACOG (AAP & ACOG, 2007) recommend routine screening for GDM by risk factor analysis (patient history and clinical risk factors) and oral glucose tolerance testing when indicated. In addition, women diagnosed with GDM should also be screened 6-12 weeks after birth due to increased risk for type-2 diabetes (ADA, 2008). Pregnant women who meet all of the following requirements are at very low risk for GDM and may not need glucose challenge screening:

1. Age younger than 25 years
2. Not a member of a racial or ethnic group with a high prevalence of diabetes mellitus (i.e., not Hispanic, African, Native American, South or East Asian, or Pacific Islands ancestry)
3. Body mass index of 25 or less
4. No history of abnormal glucose tolerance
5. No history of adverse pregnancy outcomes usually associated with GDM
6. No known diabetes mellitus in first degree relative (AAP & ACOG, 2007, p 104).

In contrast to the recommendations of ACOG and the ADA, the USPSTF states there is insufficient evidence to recommend for or against routine screening for gestational diabetes (USPSTF, 2008). A 2003 Cochrane review on treatments for GDM concluded that there is not enough evidence on beneficial effects of treatments for glucose intolerance on perinatal outcomes (Tuffnell, West, & Walkinshaw, 2003).

Recommendations for the screening of GDM vary according to the source. ACOG recommends screening for GDM at 24 to 28 weeks gestation, using a 50 gram 1 hour oral glucose challenge. The test may be administered regardless of the time of the last meal. Either threshold of 130 mg/dl or 140 mg/dl may be used, although 140 mg/dl has less sensitivity than 130 mg/dl, but fewer false positives. Women who fail the 1 hour oral glucose challenge will be further evaluated using the 3 hour oral glucose tolerance test. ACOG recognizes two diagnostic criteria for the 3 hour oral glucose tolerance test: Carpenter/Coustan Conversion and National Diabetes Data Group Conversion. A positive diagnosis of GDM requires that two or more thresholds be met or exceeded (ACOG, 2001). Table 2.2 presents the two diagnostic criteria.

The ADA guidelines differ slightly from ACOG for GDM screening and for normal parameters. The ADA recommends risk assessment for GDM at the first prenatal visit. Women who have severe obesity, previous history of GDM or large-for-gestational-age infant, glycosuria, diagnosis of polycystic ovarian syndrome, or strong family history

Table 2.2
Two Diagnostic Criteria For Gestational Diabetes Mellitus

Status	Plasma or Serum Glucose Level Carpenter/Coustan Conversion	Plasma Level National Diabetes Data Group
Fasting	95 mg/dl	105 mg/dl
One hour	180 mg/dl	190 mg/dl
Two hours	155 mg/dl	165 mg/dl
Three hours	140 mg/dl	145 mg/dl

Note. From "ACOG Practice Bulletin. Clinical Management Guidelines for Obstetricians-Gynecologists. Number 30," by American College of Obstetricians and Gynecologists Committee on Practice Guidelines – Obstetrics, 2001, *Obstetrics and Gynecology 98*(3), p. 529.

of type 2 diabetes should be tested as soon as possible. Screening thresholds at this stage consist of a fasting (nothing by mouth for previous eight hours) plasma glucose greater than or equal to 126 mg/dl; or symptoms of hyperglycemia (polyuria, polydypsia, unexplained weight loss) and a causal (any time of day regardless of intake) plasma glucose greater than or equal to 200 mg/dl; or two hour plasma glucose greater than or equal to 200 mg/dl during an oral glucose tolerance test using a 75 grams glucose loading.

All women who do not meet the six previously listed criteria for very low risk should undergo GDM testing at 24 to 28 weeks gestation, including higher risk women who were tested earlier in pregnancy (ADA, 2008). Initial screening is performed by measuring serum or plasma blood glucose levels one hour after a 50 gram glucose load. Depending on the clinician, women whose glucose are greater than or equal to either 130 mg/dl or 140 mg/dl will need further testing using the 3 hour oral glucose tolerance test. According to the ADA, using a threshold of 140 mg/dl will identify approximately 80% of women with GDM while a threshold of 130 mg/dl will identify approximately 90% of women with GDM. GDM is diagnosed if at least two of the following thresholds are met

or exceeded: fasting ≥ 95 mg/dl, one hour ≥ 180 mg/dl, two hour ≥ 155 mg/dl, three hour ≥ 140 mg/dl (ADA, 2008).

Maternal Serum Screening

Maternal serum screening is used in pregnant women to identify increased risk for trisomy 21 and 18 defects, neural tube defects (NTDs), and other aneuploidies (abnormal number of chromosomes). The tests consist of first-trimester combined serum screening with ultrasound assessment of fetal nuchal translucency, second-trimester triple or quadruple marker serum screening, and combined first and second-trimester fetal aneuploidy screening approaches. All women receiving prenatal care before 20 weeks gestation should receive screening for aneuploidy, regardless of age (AAP & ACOG, 2007). Maternal serum screening is used to detect a population of women who are at increased risk for Down's syndrome and other aneuploidies, but is not diagnostic. Women with positive screens should be offered diagnostic testing such as chorionic villus sampling (CVS) or amniocentesis. Maternal serum screening helps to decrease the number of women who need to undergo invasive procedures such as CVS or amniocentesis that put the fetus at risk.

First- trimester serum screening consists of pregnancy associated plasma protein-A and free β-hCG. Women who select this option should also be offered either ultrasound screening for neural tube defects (NTDs) or second-trimester maternal serum alpha-fetoprotein (MSAFP) testing. First trimester screening is generally performed at 10-13 weeks gestation.

Second-trimester triple screen consists of AFP, estriol, and β-hCG, while quadruple screen consists of the previous three tests plus inhibin-A. Second-trimester testing should be performed at 15-20 weeks gestation (AAP & ACOG, 2007).

Fetal Movement Monitoring

Fetal movement monitoring (FMM), also referred to as fetal kick count, is the counting of fetal movements to assess the condition of the baby (Mangesi & Hofmeyr, 2007). In the 1970s and 1980s, FMM was a popular method for screening fetal well being. However, after research published by the Lancet in 1989 indicating that FMM did not reduce stillbirths, interest and research in FMM seemed to decline (Froen, 2004). In 2004 a literature review performed by Froen indicated that FMM reduces perinatal mortality. A Cochrane review published in 2007 reports that there is "not enough evidence to influence practice" (Mangesi & Hofmeyr, 2007, p. 1). Of particular concern is that there are no trials comparing fetal movement counting with no fetal movement counting. Both of these reviews acknowledge the need for more research. ACOG (2007) recognizes that decreased fetal movement may precede fetal death and suggest daily monitoring after 28 weeks gestation by counting ten movements in a two hour period.

The literature reviewed seems to acknowledge two main methods of counting fetal movement: the Sadovsky method and the Cardiff count-to-ten method. Although several methods are described, they all seem to be variations of these two methods. The Sadovsky method has women count four fetal movements three times a day for one hour after meals (Freda et al., 1993). If four fetal movements are not felt in one hour, then the woman should count for one more hour. If at that time four movements have not been felt, the woman is advised to call her provider. The Cardiff count-to-ten method has

women count the first ten movements of the day for up to twelve hours. If ten movements are not felt in twelve hours, the woman is advised to contact her provider (Freda et al., 1993). Other common methods are listed in table 2.3. The variations in these methods show that an optimal method, number of movements, recording period, or definition of decreased fetal movement has not been determined.

Table 2.3
Techniques for Monitoring Perceived Fetal Motion

Study	Definition of Decreased Fetal Activity	Recording Periods
Pearson & Weaver (1976)	<10 movements/12 hour	12 hours (9:00 AM-9:00 PM) daily
Sadovsky & Palishuk (1977)	< 2 movements/hour	30 minutes to 1 hour, twice or three times daily
Neldham (1980)	≤ 3 movements/hour	One 2-hour period, three times weekly
O'Leary & Andrinopoulos (1981)	0-5 movements/30 minutes for each of the three 30-minute periods	Three 30-minute periods, daily
Harper et al. (1981)	Complete cessation	Three 1-hour periods, daily
Leader et al. (1981)	1 day of no movements or 2 successive days/week in which there are <10 movements/hour	30 minutes, four times daily
Rayburn (1982)	<3 movements/hour for 2 consecutive hours	>1 hour (when convenient)
Picquadio & Moore (1998)	<10 movements/hour for 2 consecutive hours	Count to 10 movements (no time restriction)

Note. From "Antenatal Evaluation of the Fetus Using Fetal Movement Monitoring," by M. Valazquez and W. Rayburn, 2002, *Clinical Obstetrics and Gynecology, 45*(4), p. 1000.

Chapter Three: Method

This chapter describes the methods used for this level II comparative study of routine obstetrical screening practices of NPs and CNMs.

Sample Population

The sample was a random sample of NPs obtained from the National Association of Nurse Practitioners in Women's Health (NPWH) and CNMs from the American College of Nurse-Midwives (ACNM). A random sample of 250 names of current, active members was obtained from each organization.

Instrument

The instrument used for this study was a 37-item survey previously developed for another study. The survey was modified based on the pilot study data and to reflect the current state of the science with respect to screening. The survey has three sections: demographic data, general obstetric screening practices, and specific screening practices in the five areas of interest: maternal serum markers, bacterial vaginosis, group B streptococcus, gestational diabetes, and fetal kick count (see Appendix A). Content validity of the survey was verified with review by two experts in prenatal care.

Procedures for Data Collection

Human subject approval was obtained from the Institutional Review Board of the University of North Florida (see Appendix B). A postcard was sent to the NPWH and ACNM members requesting them to participate in the survey (see Appendix C). The postcard contained the URL for the University of North Florida Brooks College of Health, which contained a link directly to the survey. The survey itself was deployed

using Survey Monkey, a web site used to create surveys, then collect and tabulate the data. The web site is secure and does not use any information for its own purposes. Survey Monkey has met Safe Harbor requirements and is on the Safe Harbor list of companies. The online survey was open for six weeks after the postcards were mailed. Participants were also given the option to receive a paper copy of the survey via the United States Postal Service, with a self addressed stamped envelope to return the survey.

Chapter Four: Results

This chapter presents the results of this level II comparative study. The results include the demographic characteristics of the sample as well as the screening practices of NPs and CNMs.

Characteristics of the Sample

Seventy-six individuals completed the survey between August 4, 2008 and September 15, 2008. One individual requested and completed a hard copy of the survey. Three of the completed surveys were not usable: two individuals did not provide prenatal care and one only provided care up to 8 weeks gestation. This left 73 usable surveys.

Of the 73 individuals, 72 were female. The age range was 28 to 63 (M = 46.34, SD = 9.99). The majority of the respondents (55, 76.4%) held a master's degree in nursing, were certified in advanced practice nursing (72, 98.6%) and were practicing CNMs (49, 67.1%). Respondents reported seeing 10 to 4000 pregnant patients in their practices annually (M = 647.58, SD = 877.56). The majority (62, 84.9%) were in practice with OB/GYN physician(s) and other APNs (nurse practitioners and/or nurse-midwives). Most (47, 64.4%) belong to one or more advanced practice nursing organizations. Table 4.1 presents the details of the sample characteristics.

Table 4.1
Characteristics of This Sample of APNs and APN Practice

Characteristic	N	%
Highest Level of Education* (N=72)		
Certificate	5	6.9
Bachelors in nursing	2	2.8
Bachelors in another field	1	1.4
Masters in nursing	55	76.4
Masters in another field	6	8.3
Doctorate in nursing	2	2.8
Doctorate in another field	2	2.8
Advanced Practice Specialty* (N=73)		
Family nurse practitioner	3	4.1
Nurse-midwife	49	67.1
Women's health nurse practitioner	23	31.5
Advanced Practice Certification* (N=73)		
American College of Nurse-Midwives	44	60.3
National Certification Corporation	24	32.8
American Nurse Credentialing Center	4	5.5
American Academy of Nurse Practitioners	2	2.7
No certification	1	1.4
Type of Practice Setting (N=73)		
With OB/GYN physician(s)	15	20.5
With OB/GYN physician(s) and other APNs	47	64.4
With Family Practice physician(s)	1	1.4
With Family Practice physician(s) and other APNs	5	6.8
With other APNs and CNMs	5	6.8

*Some individuals chose more than one category

In general, routine prenatal diagnostic screening and testing was performed by the majority of the sample (see Table 4.2). Respondents indicated that several screening and diagnostic tests are done within their own office setting: glucose testing (55, 73.2%), hemoglobin testing (52, 73.2%), non-stress testing (44, 60.3%), and OB ultrasound (44, 60.3%).

Table 4.2
Routine Obstetrical Screening N = 73

Test	*Routinely ordered*		*First trimester*		*Second trimester*		*Third Trimester*	
	N	%	N	%	N	%	N	%
CBC	64	87.7	45	61.6	1	1.4	34	46.6
H&H	30	41.1	10	13.7	1	1.4	25	34.2
RPR	63	86.3	43	58.9			15	20.5
Chlamydia culture	57	78.1	39	53.4			19	26
Gonorrhea culture	57	78.1	39	53.4			19	26
HSV	7	9.6	5	6.8			5	6.8
HIV	58	79.5	39	53.4			14	19.2
Pap	60	82.2	40	54.8			2	2.7
Urine	56	76.7	37	50.7			3	4.1

As to the five specific screenings, 20 (27.4%) of the respondents have a written protocol for bacterial vaginosis screening, 55 (75.3%) for Group B strep screening, 54 (74%) for gestational diabetes screening, 43 (58.9%) for maternal serum markers and 33 (45.2%) for fetal kick count monitoring (see Table 4.3).

Table 4.3
Screening for Five Specific Conditions

Screening	Written protocol		Routinely ordered			
			CNMs (N=49)		NPs (N=24)	
	N	%	N	%	N	%
Bacterial vaginosis	20	27.4	9	18.4	10	41.7
Group Beta Strep	55	75.3	49	100.0	24	100.0
Gestational diabetes mellitus	54	74.0	48	98.0	24	100.0
Maternal serum markers	43	58.9	26	53.1	13	54.2
Fetal kick counts	33	45.2	29	59.2	13	54.2

Bacterial Vaginosis

Few (19, 26.0%) respondents report routinely screening for BV. There was a significant difference in routine screening between CNMs and NPs with NPs screening more frequently (Chi square = 4.54, p =.033). Most of those who do screen (14, 77.8%) do so in the first trimester. Other responses include screening in the first and third

trimester (2, 11.1%) and at the first visit (2, 11.1%). The most commonly used diagnostic parameters are the presence of clue cells (16, 84.2%) and whiff (amine) test (14, 73.7%). Culture is used by 5 (26.3%) and nitrazine paper by 3 (15.8%). Respondents who do not routinely screen for BV stated screening was performed if the patient had complaints or signs and symptoms of BV (38, 71.7%), patient had signs and symptoms and preterm labor (14, 26.4%), or if the patient had history or preterm labor (1, 1.9%). Of the 17 respondents who answered the question regarding treatment for BV, 12 (70.6%) use metronidazole (see table 4.4).

Table 4.4
Treatment Regimens for BV

Treatment	First trimester		Second trimester	
	N=15	%	N=13	%
Nothing	4	26.7	0	0
Metronidazole PO 500 mg TID x 7 days	3	20.0	3	23.1
Metrogel 1 applicator per vagina q HS x 5 days	2	13.3	1	7.7
Metronidazole PO 250 mg TID x 7 days	2	13.3	4	30.8
Metronidazole PO 500 mg BID x 7 days	1	6.7	2	15.4
Metronidazole PO 1 gm x 1 dose	1	6.7	1	7.7
Clindamycin PO 300 mg BID x 7 days	1	6.7	1	7.7
Clindamycin Cream 1 applicator p.v. qhs x 7 days	1	6.7	0	0
Metronidazole PO 2 gm x 1 dose	0	0	1	7.7

Group B Streptococcus

All respondents indicated they routinely screen for GBS. Forty-six (63%) use the culture based approach, 2 (2.7%) use the risk factor approach, and 20 (27.4%) use both approaches. See table 4.6 for risk factors considered in the risk factor approach.

Table 4.5
Risk Factors to Screen for GBS

Condition	N	Percent
Previous child affected with GBS	17	23.3
Positive GBS culture in previous pregnancy	11	15.1
Multifetal gestation	1	1.4
Previous history of preterm labor or PROM	8	11.0
GBS UTI in pregnancy	19	26.0
Preterm labor or PROM	2	2.7

The majority of respondents (39, 53.4%) perform GBS cultures at 36 weeks gestation, followed by 16 (21.9%) at 35 weeks, 3 (4.1%) at 34 weeks, 2 (2.7%) at 37 weeks and 1 (1.4%) at 33 weeks. Most commonly, cultures are obtained from the vagina (65, 89.0%) and the anorectal area (67, 91.8%). Other areas included the cervix (4, 5.5%), urethra (4, 5.5%), and the urine (1, 1.4%). Most respondents (65, 89.0%) treat positive GBS when the patient is in labor only. Four respondents (5.5%) treat at the time of the positive result and in labor.

Gestational Diabetes Mellitus

Seventy-two (98.6%) of the respondents routinely screen for GDM between 24 and 28 weeks gestation. There was no significant difference in routine screening between CNMs and NPs (Chi square = .497, p = .481). Most screen for GDM at 28 weeks (36, 51.4%) followed by 26 weeks (19, 27.1%), 27 weeks (10, 14.3%), 24 weeks (4, 5.7%) and 25 weeks (1, 1.4%). The most common risk factors for early screening were a previous history of GDM and a history of macrosomia (see table 4.5). Respondents who did stated they did not routinely screen for GDM stated they screen only when risk factors are present (1, 1.4%).

Table 4.6
Risk Factors for Early Screening (before 28 weeks) for GDM

Risk Factor	N	%
Previous history of GDM	71	97.3
History of macrosomia	60	82.2
Obesity	48	65.8
Family history of diabetes	45	61.6
Previous unexplained fetal death	35	47.9
Previous birth of infant with unexplained congenital abnormalities	23	31.5
Glycosuria	5	6.8
Advanced maternal age	2	2.7
Recurrent yeast infections	2	2.7
Metabolic syndrome or polycystic ovary disease	1	1.4
Polyhydraminos	1	1.4
Native American ethnicity	1	1.4

Fifty-five (78.6 %) of the respondents use a non-fasting prep for the 1 hour glucose screen, 9 (12.9%) use a fasting prep and 5 (8.6%) use a specific diet. Most respondents (29, 40.8%) use 140 as the cutoff for the 1-hour screen. Twenty-two (31.0%) use less than 135, 16 (22.5%) use 135 and 3 (4.2%) use between 135 and 140. Respondents refer patients to a physician with an abnormal 3 hour screen (27, 37%) and when insulin is started (20, 27.4%). Others answers included with an abnormal 1 hour screen (1, 1.4%), with the start of oral medications (4, 5.6%), or when GDM is uncontrolled (1, 1.4%). Fifteen (20.5%) do not refer, but treat GDM themselves. Of the fifteen who do not refer, ten (66.7%) practice with OB/GYNs and other NPs/CNMs, four (26.7%) practice with other OB/GYNs, and one (6.7%) practices with family practice physicians and other NPs/CNMs.

Maternal Serum Markers

Thirty-nine respondents (53.4%) stated they routinely screen all patients for serum markers. There was no significant difference in routine screening between CNMs and NPs (Chi square = .008, p =.929). Of the practitioners who routinely screen, the

screening was done between 14 and 19 weeks with 16 weeks (12, 31.6%) and 18 weeks (15, 39.5%) being the most common. Most practitioners (30, 73.2%) ordered the quad screen. Other screenings ordered included the triple screen (5, 12.2%), triple screen with cystic fibrosis (2, 4.9%), alpha fetal protein (1, 2.4%), quad screen or integrated screening (1, 2.4%), quad screen, integrated screening and nuchal translucency (1, 2.4%). One respondent (2.4%) stated the test ordered would depend on the risk and when the patient presents for care.

Most respondents (30, 88.2%) who do not routinely screen for maternal serum markers do screen at the patient's request or desire. One respondent (2.9%) screens at the patient's request or with perinatologist recommendations. Three respondents (8.8%) who do not routinely screen state screening for maternal serum markers is done on high risk patients such as advanced maternal age or personal history.

Fetal Movement

Fetal kick counts are routinely ordered by 42 (57.5%) of the respondents. There was no significant difference in routine screening between CNMs and NPs (Chi square = 1.32, p =.517). Eighteen (24.7%) do not routinely order fetal kick counts and 13 (17.8%) only instruct patients to monitor fetal movement if there is a complication. Most advanced practice nurses have women monitor fetal movement during a particular week of gestation (see Table 4.7).

Instructions on how to monitor fetal movement were divided into five main categories, most of which involved some variation on count-to-ten (see Table 4.8). Instructions on what to do for decreased fetal movement included either reassessing the

movements before contacting the practitioner or contacting the practitioners right away.

(see Table 4.8).

Table 4.7
When Fetal Movement Monitoring Begins

Time	N	%
Based on Gestational Age		
32-35 weeks gestation	17	23.3
29-31 weeks gestation	16	21.9
20-28 weeks gestation	14	19.2
36-40 weeks gestation	6	8.2
Based on Other Factors		
Only if decreased fetal movement	9	12.3
Only if high risk	7	9.6
Only post-term	1	1.4
If fetus is small or concerned about movement	1	1.4

Table 4.8
Instruction for Fetal Movement Monitoring

Instructions	N	%
How To Count		
Count 5-10 movements in 30 minutes to 2 hours	46	65.7
Eat, drink or lie down and count for 1 hour	11	15.7
Time how long 10 movements take	7	10.0
Be aware of movements and normal rhythm	4	5.7
10 movements in 9-10 hours	2	2.9
What to do for Decreased Movement		
Eat, drink or lie down and re-attempt the count before calling the office, or going to the hospital	45	64.3
Call the practitioner or go to the office or hospital without first re-attempting the count	23	32.9
Re-monitor (with no other instructions given)	1	1.4
Call only if no movement in 24 hours	1	1.4

Chapter Five: Discussion

Many women receive prenatal care provided by NPs and CNMs every year. As more NPs and CNMs enter the healthcare industry, it is important that they provide appropriate care as described by agencies such as ACOG, ADA, and USPSTF. In areas where guidelines are not agreed upon or no guidelines exist, NPs and CNMs should guide their practice based on current evidence.

This survey focused on five areas of screening during prenatal care: bacterial vaginosis, group B streptococcus, gestational diabetes, maternal serum screening, and fetal movement monitoring. In comparing NPs and CNMs, there was no statistical difference in practice except for screening for BV. More NPs (41.7%) routinely screened for BV than CNMs (18.4%) (Chi square = 4.54, p = .033). Of all five screenings, only GBS was routinely performed 100% by both NPs and CNMs followed by 98% who routinely screen for GDM.

Implications for Practice

Competence in screening practices is consistent with advanced nursing practice using the IMCHB model. In order to have such competence, APNs need to have intricate knowledge of the guidelines. When there are inconsistencies in the guidelines published by different organizations, such as in the case of obstetrical screening for BV, the provider relies on her/his clinical expertise and knowledge of the patient population to make judgments about routing screening. The CDC recommends screening for BV on the

first prenatal visit and treating all symptomatic pregnant women as well as asymptomatic women with previous history of preterm delivery (CDC, 2006). On the other hand, the USPSTF states there is insufficient evidence to make a recommendation for or against routine screening for BV, even in high risk pregnancies (USPSTF, 2008). In this sample, only 26% routinely screen their obstetrical patients for BV. Those who do not routinely screen appropriately test for BV for patient complaints or for pre-term labor. As far as treatment is concerned, the APNs prescribed metronidazole, which is the drug of choice, although the dosing of the therapy varied widely. It is interesting that only one indicated they prescribed clindamycin, since that is one of two treatment regimens that have demonstrated efficacy in reducing preterm birth, the other being metronidazole 500 mg BID x 7 days (CDC, 2006).

Although 100% of this sample routinely screen for GBS in their obstetrical patients, there remain some inconsistencies in the timing and method of the screening as well as the timing of treatment. Both the CDC and ACOG guidelines specify the culture-based approach which entails GBS screening at 35-37 weeks with vaginal and rectal cultures and antibiotic prophylaxis during labor for those with a positive culture (AAP & ACOG, 2007; Schrag et al., 2002). In this sample, only 63% actually screened in accordance with the guidelines. It may be that there is some misunderstanding of the difference between these two mutually exclusive approaches, since more than 25% indicated they used both approaches.

Both the ADA (2008) and ACOG (2001) provide guidelines for GDM, while USPSTF (2008) and a Cochrane review (Tuffnell et al., 2003) state there is not sufficient evidence to recommend routine screening for GDM. Both ADA and ACOG recommend

routine screening at 24-28 weeks based on patient history and clinical risk factors using oral glucose tolerance testing (ADA, 2008; ACOG, 2001). More than 98% of the current sample routinely screens, and 98% of those who do screen do so at the appropriate time and using 130 mg/dl or 140 mg/dl as the threshold for further testing, as recommended. ADA (2008) recommends screening high risk patients at the first prenatal visit. ACOG (2007) states that women who meet specific criteria may not need screening for GDM. Neither of these elements was addressed in the current survey.

ACOG (2007) recommends maternal serum screening all women who receive prenatal care prior to 20 weeks gestation for aneuploidy, regardless of maternal age. Despite this, only thirty-nine respondents (53.4%) stated they routinely screen for serum markers. Of the respondents who do not routinely screen, 88.2% stated they screen at the patient's request or desire. It is probable that these advanced practice nurses educate every patient on risks and benefits of screening, and then give them an option. Future research should explore this further.

Fetal movement monitoring remains an interesting subject since there is so much conflicting literature and lack of quality research related to it. Although there are no specific recommendations for fetal movement monitoring, ACOG (2007) does recognize that a decrease in fetal movement may precede fetal death and suggests daily monitoring after 28 weeks gestation. Forty-two (57.5%) of the respondents stated that they ask their patients to monitor fetal movements. Most (88.7%) begin monitoring between 20 and 35 weeks gestation. Although several different methods for monitoring fetal movement exist, most are some variation of the count-to-ten method, which 46 (65.7%) of the respondents stated they use. In reviewing the literature, no real specific instructions were

found stating what women should do if they feel as if they are experiencing decreased fetal movements. Forty-five (64.3%) of the respondents stated they have the patient re-attempt the count before any further action is taken. Twenty-three (32.9%) of the respondents have the patient call or proceed to the office or hospital without first re-attempting the count.

Limitations of the Study

Although the survey used for this study has been used before in another study and had been adapted according to the results of that study, an additional piece of information that may have been interesting to add would have been in which state the respondent practiced. The state of practice would possibly show if there were any regional variations in practice. Another interesting note is that some respondents when asked if they routinely screen would put no as an answer and in the explanation box, would state that they only screen at patient's request or other similar response. The wording on some of the questions may have been changed to "do you routinely offer" in order to get a more accurate response. Another limitation is that only 75 APNs responded to the survey. It is possible that only those who are comfortable with technology and computers responded to the survey. Another possible limitation is that those APNs who do routinely screen may be more inclined to complete the survey. The lack of any follow-up communication regarding the survey may have been responsible for the low response rate.

Implications for Further Study

Many areas exist for further study of obstetrical screening practices. Research could include asking providers which guidelines they use when ordering certain tests. The survey could be made available at national conferences on computers as well as

written to allow for greater number of respondents. Comparisons could be made between physicians and advanced practice nurses.

Fetal movement monitoring is an area that lends itself to further study due to the lack of consistent information and quality research. Research might include more comprehensive surveys of advanced practice nurses as well as physicians focusing primarily on fetal movement monitoring. Research focusing on the relationship between decreased fetal movement and the results of subsequent non-stress testing and biophysical profile testing could provide valuable data about the efficacy and practicability of routinely asking women to monitor fetal movement. Actually being able to answer the question of whether maternal monitoring of fetal movement actually impacts intrauterine fetal death rates in term pregnancies is likely to be impractical, since the outcome is relatively rare.

Appendix A

Online Survey

Obstetric Screening Practices of Nurse-Midwives and Nurse Practitioners
Laura Abney, a graduate student in the University of North Florida master's program in nursing, is interested in understanding more about routine obstetrical screening practices of nurse-midwives with respect to maternal serum markers for fetal abnormalities, bacterial vaginosis, gestational diabetes, fetal kick counts, and group B Strep. The survey will take about 10 minutes to complete. This site is a secure one, and only the survey data are captured and recorded. We receive only the aggregate report, with no identifying data. Completion and submission of the survey indicates your willingness to participate.

If you have any questions, or to request hard copies of the survey, you may contact Laura Abney (laurabuntley@bellsouth.net) or Kathy Bloom (kbloom@unf.edu). If you have questions about your rights as a research subject you may contact Nicole Sayers at the Research Compliance office at the University of North Florida (620-2498).

Instructions: Please check the applicable response that reflects your clinical practice related to obstetrical screening.

Demographics Please share a little about yourself and your practice.

1. What is your age?
2. What is your gender?
   - ☐ Female
   - ☐ Male
3. What is your highest level of education?
   - ☐ Bachelor's in nursing
   - ☐ Bachelor's in another field
   - ☐ Master's in nursing
   - ☐ Master's in another field:
   - ☐ Doctorate in nursing
   - ☐ Doctorate in another field
4. What is your specialty?
   - ☐ Adult Nurse Practitioner
   - ☐ Family Nurse Practitioner
   - ☐ Nurse-Midwife
   - ☐ Women's Health Nurse Practitioner
   - ☐ Other: _____

5. Are you certified in advanced practice?
   - ☐ No
   - ☐ Yes: By Whom?
     - ☐ ACNM
     - ☐ ACT.
     - ☐ ANCC
     - ☐ Other: _____

6. Do you hold membership in professional organizations for advanced practice nurses? [Check all that apply]
   - ☐ American Academy of Nurse Practitioners
   - ☐ American College of Nurse-Midwives
   - ☐ American College of Nurse Practitioners
   - ☐ Association of Reproductive Health Professionals
   - ☐ National Association of Nurse Practitioners in Women's Health
   - ☐ Other: _____

7. Which of the following most accurately describes your practice [Choose ONE]
   - ☐ Practice with OB/GYN physician(s)
   - ☐ Practice with OB/GYN physician(s) and other nurse practitioners/nurse-midwives
   - ☐ Practice with Family Practice physician(s)
   - ☐ Practice with Family Practice physician(s) and other nurse practitioners/nurse-midwives
   - ☐ Other: _____

8. Approximately how many pregnant women do **you** see each year?

General Screening Practices

9. Which of the following screening tests do you routinely order for or offer to **all** OB patients?

Test	Routinely order	First Trimester	Third Trimester	Other (Specify)
CBC	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
H&H Only	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
RPR	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
Chlamydia Culture	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
Gonorrhea Culture	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
HSV Testing	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
HIV Testing Encouraged	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
Pap Smear	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
Urine Culture	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	

10. Identify where the following screening tests are done for your OB patients:
    a. OB ultrasound ☐ In my office ☐ Referred out
    b. NST ☐ In my office ☐ Referred out
    c. Glucose testing ☐ In my office ☐ Referred out
    d. Hemoglobin ☐ In my office ☐ Referred out

11. For which of the following does your practice have written protocols for routine screening of OB patients?
    ☐ Maternal Serum Markers of Fetal Abnormalities
    ☐ Bacterial Vaginosis
    ☐ Gestational Diabetes
    ☐ Group B Strep
    ☐ Fetal Kick Counts

Screening for Maternal Serum Markers of Fetal Abnormalities

12. Do you routinely order or offer screening to **all** OB patients for serum markers?
    ☐ No - go to question # 15
    ☐ Yes - go on to question # 13
13. When do you do this screening? _____ weeks gestation

14. What test do you order? [Choose ONE]
    - ☐ AFP
    - ☐ Triple Screen
    - ☐ Triple Screen with cystic fibrosis
    - ☐ Quad Screen with cystic fibrosis
    - ☐ Other: _____

15. If you **do not** routinely order or offer screening to all OB patients for serum markers, under what conditions do you screen? _____

Screening for Bacterial Vaginosis

16. Do you routinely order or offer screening to **all** OB patients for Bacterial Vaginosis?
    - ☐ No - go to question # 20
    - ☐ Yes - go on to question # 17

17. When do you do this screening? [Check all that apply]
    - ☐ First trimester
    - ☐ Third trimester
    - ☐ Other:

18. What diagnostic criteria do you use? [Check all that apply]
    - ☐ Nitrazene paper
    - ☐ Wet prep
    - ☐ Culture

19. What treatment do you order for positive BV? [Choose the ONE you prescribe most frequently for first trimester and the ONE you choose most frequently after the first trimester].
    - ☐ Metrogel 1 applicator per vagina HS x 5 days
      ☐ First trimester ☐ After the first trimester
    - ☐ Metronidazole PO 2 Gm x 1 dose
      ☐ First trimester ☐ After the first trimester
    - ☐ Metronidazole 250 mg PO TID x 7 days
      ☐ First trimester ☐ After the first trimester
    - ☐ Metronidazole 500 mg PO TID x 7 days
      ☐ First trimester ☐ After the first trimester
    - ☐ Clindamycin 300 mg PO BID x 7 days
      ☐ First trimester ☐ After the first trimester
    - ☐ Clindamycin cream 1 applicator/vagina HS x 7 days
      ☐ First trimester ☐ After the first trimester
    - ☐ Other:
      ☐ First trimester ☐ After the first trimester
    - ☐ Nothing
      ☐ First trimester ☐ After the first trimester

20. If you **do not** routinely order or offer screening to all OB patients for Bacterial Vaginosis, under what conditions do you screen? _____

Screening for Gestational Diabetes

21. Do you routinely order or offer screening to **all** OB patients for Gestational Diabetes?
    - ☐ No - go to question # 28
    - ☐ Yes - go on to question # 22

22. When do you do this routine screening? _____ weeks gestation

23. What risk factors do you use for an **early** screen?
    - ☐ Obesity
    - ☐ Previous history of GDM
    - ☐ History of macrosomia
    - ☐ Family history of diabetes
    - ☐ Previous unexplained fetal death
    - ☐ Previous birth of an infant with unexplained congenital abnormalities
    - ☐ Other: _____

24. What prep do you have for the 1 hour screen?
    - ☐ Fasting
    - ☐ Nonfasting

25. What cut off do you use for the 1 hour screen
    - ☐ 135
    - ☐ 140
    - ☐ Other: _____

26. At what point do you refer to a perinatologist?
    - ☐ With an abnormal 1 hour screen
    - ☐ With an abnormal 3 hour test
    - ☐ I do not refer, I treat women with gestational diabetes

27. If you **do not** routinely order or offer screening to all OB patients for Gestational Diabetes, under what conditions do you screen? _____

Group B Strep

28. Do you routinely order or offer screening to **all** OB patients for Group B Strep?
    - ☐ No - go to question # 28
    - ☐ Yes - go on to question # 29

29. Do you use the:
    - ☐ Risk Factor Approach - go to question # 30
    - ☐ Culture-Based Approach - go to question # 31

30. If you use the Risk Factor Approach, for what conditions in pregnancy do you consider risk factors? [Check all that apply]
    - ☐ Previous child affected with GBS
    - ☐ Previous history of preterm labor or preterm PROM
    - ☐ Multifetal gestation
    - ☐ GBS UTI in pregnancy
    - ☐ Other: _____

31. If you use the Culture-Based Approach, when do you do the culture? _____weeks gestation.

32. From which site(s) do you obtain a screening culture? [Check all that apply]
    - ☐ Vagina
    - ☐ Cervix
    - ☐ Anorcctal area
    - ☐ Urethra
    - ☐ Other: _____

33. If a positive screening culture is obtained from one of these sites, when do you treat (or when is treatment recommended)?
    - ☐ At the time of the positive result **only**
    - ☐ At the time of the positive result **and** in labor
    - ☐ In labor **only**

Fetal Kick Counts

34. Do you routinely recommend fetal kick counts for all OB patients?
    - ☐ No - go to question #
    - ☐ Yes - go to question # 35

35. When do you have pregnant women begin kick counts?
    - ☐ 20-28 weeks gestation
    - ☐ 29-31 weeks gestation
    - ☐ 32-35 weeks gestation
    - ☐ 36-40 weeks gestation
    - ☐ Only if decreased movement
    - ☐ Only if high risk

36. What instructions do you give about how to count fetal movements? Please be specific.
37. What instructions do you give about what to do if there is a decrease? Please be specific.

Appendix B

University of North Florida Institutional Review Board Approval

Office of Research and Sponsored Programs
1 UNF Drive
Building 3, Office 2501
Jacksonville, FL 32224-2665
904-620-2455 FAX 904-620-2457
Equal Opportunity/Equal Access/Affirmative Action Institution

MEMORANDUM

DATE: March 24, 2008

TO: Laura Abney

VIA: Dr. Kathaleen C. Bloom
Nursing

FROM: Dominique Scalia, Research Integrity Coordinator
On Behalf of the UNF Institutional Review Board

RE: Review by the UNF Institutional Review Board IRB#08-047: "Obstetrical Screening Practices of Nurse-Midwives and Nurse Practitioners"

This is to advise you that your study, "Obstetrical Screening Practices of Nurse-Midwives and Nurse Practitioners," has been reviewed on behalf of the UNF Institutional Review Board and has been declared exempt from further IRB oversight.

This approval applies to your project in the form and content as submitted to the IRB for review. Any variations or modifications to the approved protocol and/or informed consent forms as they relate to dealing with human subjects must be cleared with the IRB prior to implementing such changes.

Should you have any questions regarding your approval or any other IRB issues, please do not hesitate to contact me at 620-2443 or d.scalia@unf.edu.

Thank you.

Appendix C

Recruitment E-mail or Postcard

Laura Abney, a graduate student in the University of North Florida master's program in nursing, is interested in understanding more about routine obstetrical screening practices of nurse-midwives with respect to maternal serum markers for fetal abnormalities, bacterial vaginosis, gestational diabetes, fetal kick counts, and group B Strep.

Your name was chosen at random from the ACNM [NPWH] Member Directory. We have received permission from ACNM [NPWH] to use the member list for this purpose.

The process is easy. Just log on to the Web site listed below and go to the appropriate survey. Your anonymity is completely assured. The survey will take approximately 10 minutes to complete and your completion of the survey indicates your consent to participate in the research. The survey can be accessed through the following link: www.unf.edu/brooks. Just click on **Best Practice Survey** and you will be ready to go.

Our goal is to complete data collection by September 15, 2008. If you would prefer, we can mail you a hard copy of the survey along with a stamped and self-addressed return envelope.

If you have any questions, or to request hard copies of the survey, you may contact Laura Abney (laurabuntley@bellsouth.net) or Kathy Bloom (kbloom@unf.edu). If you have questions about your rights as a research subject you may contact Nicole Sayers at the Research Compliance office at the University of North Florida (620-2498).

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Vita

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