MIXED METHODS CURRICULUM EVALUATION: MATERNITY CARE COMPETENCE

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A MIXED METHODS CURRICULUM EVALUATION: MATERNITY CARE COMPETENCE

ABSTRACT

Purpose: This study aims to pilot a mixed method design for residency curriculum evaluation using the Madigan Family Medicine (FM) Residency's Maternity Care Curriculum. The actual curriculum evaluation purposes to assess the FM residency's achievement of its curriculum objectives and key components established by the 2007 and 2011 ACGME Program Requirements for FM[1]. It is an Institutional Review Board (IRB) exempt study approved by the Madigan Department of Clinical Investigation and the University Of Washington School Of Public Health IRB. It fulfills the requirement for Masters of Public Health thesis and master's degree. The ACGME Program Requirements are currently in the process of modification. The Madigan FM Residency leadership was concerned that residents might have difficulty achieving adequate obstetrical volume under the new requirement.

Methods: This residency curriculum evaluation used a mixed methods (quantitative and qualitative) design. The quantitative method consisted of a retrospective review and analysis of previously existing data from a national database (MyEvaluations) that described the number of deliveries completed by current residents (2013-2015 graduates) and recent graduates from 2006-2012, as well as rotations completed by the 2012-2015 graduates. The "overall" and "female specific" sections on the 2007-2012 In Training Exams (ITE) were compared for significant trends. The qualitative research was accomplished through semi-structured interviews conducted from December 2012 through February 2013 with 22 current and recently graduated residents. Each interview consisted of responses to thirteen standardized questions. Interviews were audio recorded, de-identified, and transcribed. The qualitative analysis employed qualitative software for assisting with coding and identification of clusters of meaning. These clusters of meaning were then used for thematic analysis, which described the residents' experience of the curriculum, as well as their competence development in the curriculum.

Results:

The overall mean spontaneous vaginal deliveries (SVD) for Graduates 2006-2013 was 63 per resident. The mean SVD was not significantly different among the graduate years ($p = 0.297$), but the mean number of C-sections was significantly different among the graduate years ($p = 0.005$). The FM residents graduating in 2013 completed an average of four Maternity Care rotations (one L&D in PGY1, one L&D in PGY2, one complicated OB (COB) in PGY2, and one L&D in PGY3). Overall Training Exam (ITE) scores, which were analyzed among graduate years for revealed significant differences in the 2007, 2008, and 2009, ($p = 0.008$, 0.003, and < 0.0001 respectively). When class trends were observed in the Maternity Care specific section, the scores noted on the 2011 and 2012 ITE revealed an increase in scores in both the 2013 and 2014 graduate classes, but not a difference that reached significance. Four of the five graduates from 2012 were interviewed. Zero out of the four was practicing continuity obstetrics. One out the four saw obstetric patients in clinic. The qualitative analysis described themes in Maternity Care competence in obstetrics and the residents' experience in the curriculum.

Conclusions:

The information revealed through the resident interviews and thematic analysis provided valuable insights that will help influence the ongoing evolution of the FM Program Requirements in Maternity Care for the Madigan FM Residency. A Mixed Method design provides a richer evaluation of curricula than a pure quantitative approach. The Curriculum Evaluation revealed that the numbers of deliveries and rotations (exposures) are compliant with ACGME 2007 (2011) Program Requirements. Maternity Care specific ITE scores improved over the curriculum in the cohort of residents. Perceived and measured competence was achieved by the Madigan FM residents through the current Maternity Care curriculum.

INTRODUCTION

Graduate Medical Education in Family Medicine (FM) is evolving quickly. The ACGME is seeking, with national FM Educators and Leaders, to determine the identity and competencies of family physicians in the United States. Traditionally, family physicians provided full spectrum obstetric care which included uncomplicated prenatal, antenatal, and postnatal care. New ACGME Program Requirements for FM residencies may require more or less obstetric experiences than are currently required.

The Madigan FM residency determined that they would meet the new Program Requirements as soon as possible after their implementation. This curriculum evaluation was intended to determine the baseline of the Maternity Care experience so changes could be most strategic and effective.

As a Faculty Development Fellow, the primary author serves as a part-time faculty member in the Madigan FM residency. The author has a personal goal to insure that the residents graduate with a comprehensive graduate medical education that will prepare them for a full spectrum career in Military and Non-Military FM.

This curriculum evaluation evolved into a mixed methods design, which is a novel approach in FM residency program development. The Maternity Care curriculum in FM residencies is a national policy topic. This curriculum evaluation may help serve as a pilot evaluation for other residency programs that plan to implement changes to their curriculum.

CURRICULUM OBJECTIVES AND KEY COMPONENTS

The Madigan FM Maternity Care curriculum, at the time of this evaluation, consisted of the following objectives and key components, that are in accordance with the 2007 and 2011 ACGME Program Requirements for FM[1,2].

Objectives Specific to Maternity Care:

1. Perform prenatal care.

2. Independently manage L&D patients, including intra-partum care that includes spontaneous vaginal delivery and management of common intra-partum complications and emergencies; assisted deliveries (vacuum or forceps); first assist at caesarean or vaginal deliveries; and obstetrical emergencies.
3. Perform post-partum care, including management of post-partum complications.

Key components Specific to Maternity Care:

1. Perform a minimum of 40 deliveries over the three-year program, of which a minimum of ten must be continuity deliveries. At least 30 of the total deliveries must be vaginal.

2. Receive a minimum of two months of experience in Maternity Care, including the principles and techniques of prenatal care, management of L&D, and postpartum care.

The Program Requirements were updated during this evaluation and the draft proposal completed by the Residency Review Committee (RC) to the ACGME now consists of the following Maternity Care competency based objectives and key components[3].

Competency Based Objectives (Patient Care and Procedural Skills):
Must demonstrate competence in their ability to:

1. Provide Maternity Care, distinguishing abnormal and normal pregnancies;
2. Caring for common medical problems arising from pregnancy or coexisting with pregnancy;
3. Assisting a patient experiencing a spontaneous precipitous birth;
4. Demonstrating basic skills in managing obstetrical emergencies.

Key Components:

1. Residents must document 200 hours of L&D experience, or two months dedicated to participating in deliveries, and providing prenatal care and post-partum care. This experience must include a structured curriculum in prenatal, intra-partum and post-partum care.

2. Programs should provide an experience in prenatal care, labor management, and in delivery management. Some of the maternity experience should include the prenatal, delivery and postnatal care of the same patient in a continuity care relationship.

CURRICULUM EVALUATION QUESTIONS

The major evaluation questions were:

1. What are the number of resident procedures and exposures in the curriculum? Are these numbers adherent to the Program Requirements?
2. What is the lived experience of the residents in the curriculum?
3. Does the curriculum develop perceived competence and confidence among FM residents graduating from the Madigan FM residency?

BACKGROUND AND SIGNIFICANCE

FAMILY MEDICINE

Family Medicine residency curricula have changed dramatically in the last 5-10 years because of residency work restrictions, decreasing numbers of trained family physicians, the transformation of primary care through the patient-centered medical home (PCMH), and changing opinions as to the role of the family physician.[4,5] While a reported trend of decreasing numbers family physicians appears to be reversing (see Figure 1), White describes that this reversal will be insufficient to meet the anticipated

demand for primary care physicians in the United States in the next 20 years.[4]

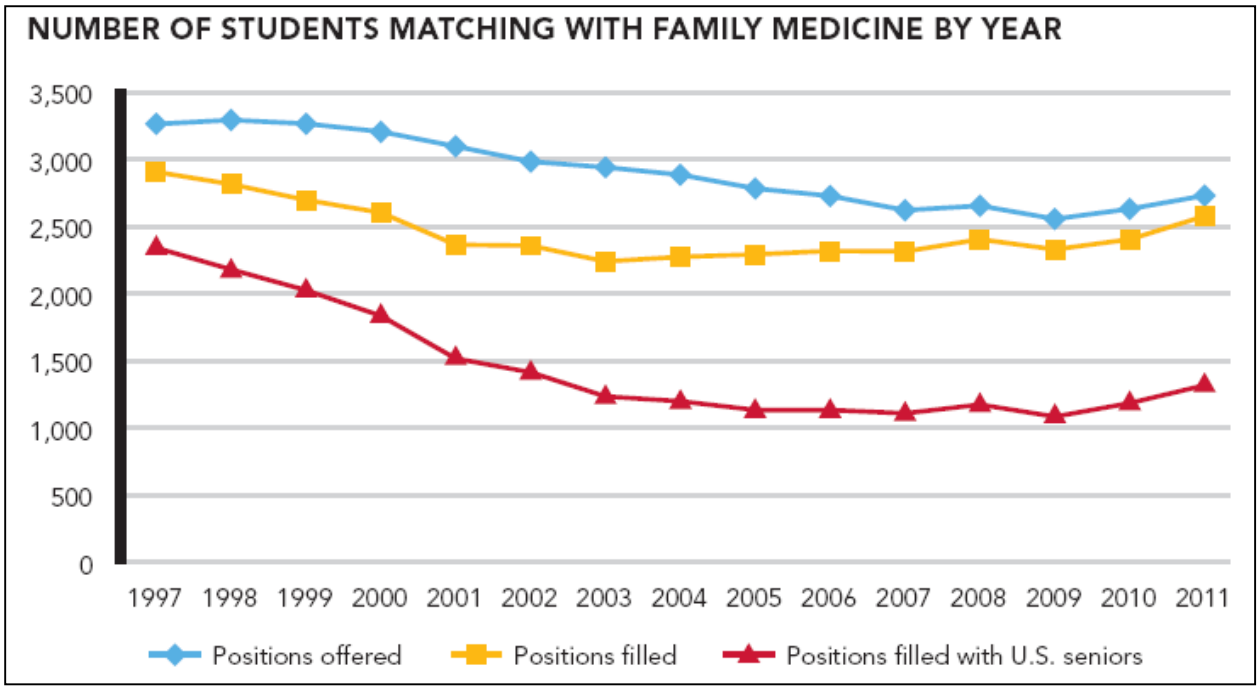


Figure 1: The number of students matching to US FM residency positions[4]

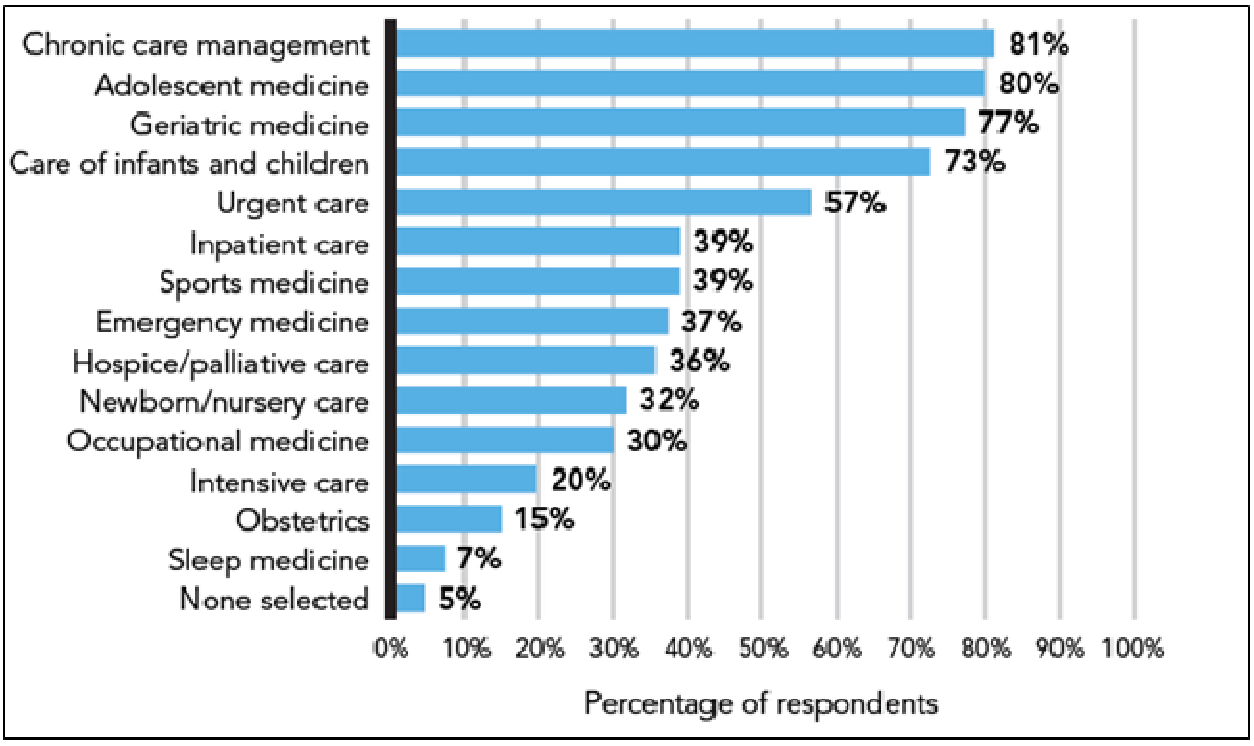
FM's identity as a specialty is based on the premise (or belief) that "the needs of the public are well served through comprehensive medical care….to have greatest significance, this close relationship also involves the physician with his patient's environment and, most particularly, with his family".[5]

MATERNITY CARE IN FAMILY MEDICINE

The practice of Maternity Care within FM was never meant to replace the role of the obstetrician. Traditionally, a family physician provides comprehensive care to a patient and involves specialists when needed. In a classic primary care model, an obstetrician represents a specialist from whom the family physician seeks consultation for high risk Maternity Care. Especially in rural settings, where specialists are not readily available, family physicians are essential in providing comprehensive patient care, including Maternity Care. When family physicians graduate from a residency they are expected to be able to provide independent Maternity Care to low-risk women and their families. Whether all family physicians should be trained to provide Maternity Care services is currently unclear, as the majority of family physicians, upon graduation, do not practice

comprehensive Maternity Care. A survey distributed by the American Academy of Family Physicians (AAFP) to its members in 2011 revealed that only 15% of family physicians provide obstetric services to their patients, compared with 30% of family physicians in 1998.[6] The author of this study hypothesized that a reason for this decline might be that family physicians consider themselves not ready to practice independent Maternity Care when they graduate due to lack of experience in residency.[6] Modified residency tracks and fellowships have been suggested so that family physicians can complete enhanced training in Maternity Care.[7] Chen etal postulated that the decrease in family physicians providing Maternity Care was not related to their training experience but other factors, including lifestyle, professional liability, restrictions on scope of practice, and demands of ambulatory practice.[6] See Figure 2 for a description of care services provided by AAFP members in 2011.

Figure 2: The most common services provided by family physicians, 2011 AAFP survey[4]



MATERNITY CARE CURRICULUM IN US FM RESIDENCIES

The United States FM residency is currently a three-year longitudinal curriculum, influenced and monitored by the Accreditation Council of Graduate Medical Education

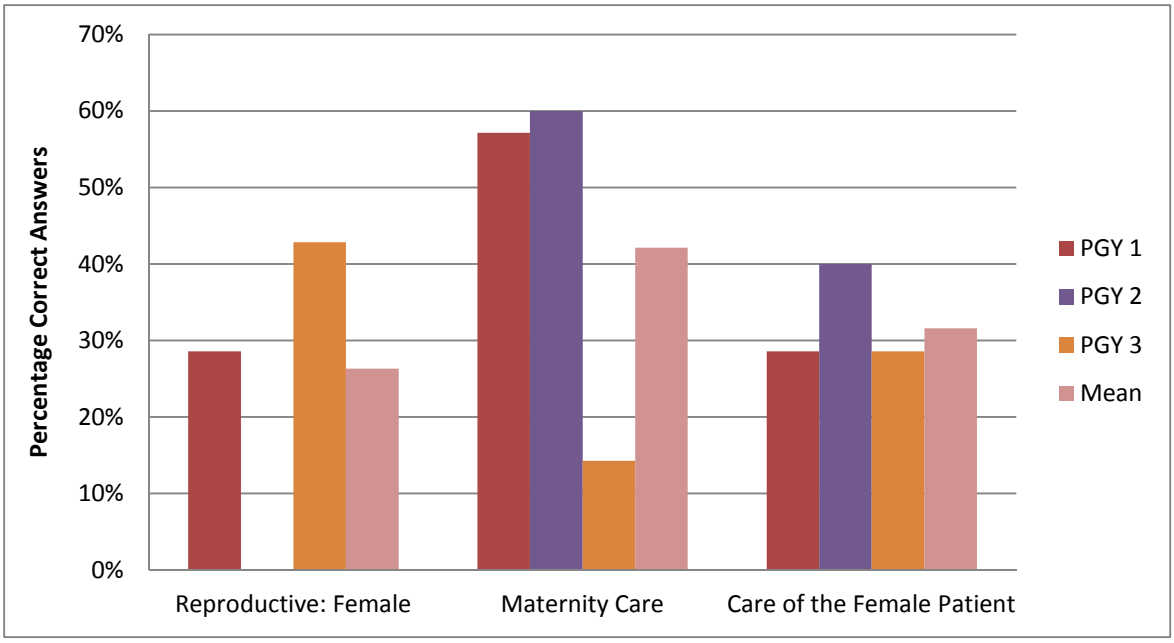
(ACGME). As mentioned above, modified curricula are emerging that include pilot four-year programs.[8] The typical curriculum begins with a 12-month internship or post-graduate, year-one (PGY1) training, which consists of 13 four-week core rotations of adult and pediatric outpatient and inpatient medicine, obstetrics, gynecology, surgery, newborn care, and critical care. It continues through 24 additional months of residency (PGY2 and PGY3) or 26 four-week rotations that are distributed among these core areas. The entire experience addresses the six core competencies established by the ACGME in 2008: patient care, professionalism, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, and system-based practice.[9]

Across the specialties, residency curricula are evolving to accommodate the work hour restrictions placed upon programs by the ACGME beginning July 1, 2003 and modified most recently on July 1, 2011.[2] Currently a resident can work no more than an average of 80 hours per week; more specifically, a PGY1 can work no more than 16 hours per day and a PGY2 or PGY3 can work no more than 24 hours continuously. These restrictions were put in place as a result of concerns about occupational risk to the resident and risk to the patients cared for by the resident, and were generally well received.[10] With a decrease in the amount of time spent in residency, however, a resident's exposure to all aspects of the FM curriculum theoretically decreased. The work hour modifications could contribute to decreased exposure to Maternity Care procedures, like spontaneous vaginal deliveries (SVD), which occur during the training.

In addition to rotations and procedures, FM Maternity Care curriculum might consist of self-directed readings, the FM In-Training Exam (ITE), a Self-Assessment Module (SAM) in Obstetrics from the American Board of Family Medicine (ABFM), and certification in the Advanced Life Support for Obstetrics (ALSO). The Family Medicine ITE is an annual exam given to all FM residents. The results of the ITE help residency program directors assess the knowledge of their residents in preparation for the FM Board Certification Exam, which is required upon graduation from residency for certification by the ABFM. Board certification is highly valued and sought after as a marker of physician competence, regardless of the specialty. The 2010 ITE scores for

the women's health sections can be seen in Figure 3 from one of the residencies in the Washington, Wyoming, Alaska, Montana, and Idaho (WWAMI) network. In theory, scores should improve with increasing years in the curriculum; however, baseline knowledge, skills, and attitudes among the residents vary. One class may be stronger than another when compared as cohorts. In addition, the ITE exam may not assess knowledge of women's health topics. A 2007 study by Dr. Williams revealed that between 1996-2005, only 23% of questions in the exam related to women's health, and of those, 8.5% related to Maternity Care.[11]

Figure 3: Example In-Training Exam (ITE) Trends in a WWAMI network FM residency, 2010



THE MADIGAN FAMILY MEDICINE RESIDENCY

The Madigan FM residency is currently a three-year longitudinal program, one of seven United States Army (USA) FM residencies. The program consists of, ideally, six residents per year. The Madigan FM curriculum and requirements are consistent with the above description for other US residencies: 13 rotations in the PGY1 and 26 additional rotations in the PGY2 and PGY3. It is located in Madigan Army Medical Center (MAMC) on Joint Base Lewis McChord (JBLM) in Washington State.

MATERNITY CARE CURRICULUM IN THE MADIGAN FM RESIDENCY

In an effort to achieve the Objectives and Specific Aims listed in the Program Requirements, the Madigan Maternity Care curriculum consists of one 4-week rotation in the PGY1 on Labor and Delivery (L&D) at MAMC with the Madigan obstetrics department, one 4-week rotation in the PGY2 on L&D at Fitzsimmons Army Community Hospital, Fort Carson, Colorado, one 4-week rotation in the PGY2 in complicated obstetric care (COB) with the Madigan Obstetrics department, and one 4-week rotation in the PGY3 on L&D at a local civilian community hospital. In addition, all the FM residents complete at least ten continuity obstetric experiences, which include prenatal clinic visits, management of the patient's L&D, and follow up postpartum clinic visits. The resident is responsible for self-directed readings and the Self-Assessment Module (SAM) from the ABFM in Maternity Care during PGY2. The FM resident will complete one simulation education session per year on obstetric emergencies. They also will certify in the Advanced Life Support for Obstetrics (ALSO) course by the end of their FM residency.

The objective assessment of competence is partially based on In Training Exam scores, which are taken on an annual basis in October in preparation for the board certification exam from the ABFM. Beginning with the graduating class of 2012, the board certification exam is completed in April of the PGY3 prior to graduation from residency. The numbers of procedures, to include deliveries, are tracked through residency on an internet portal called MyEvaluations.[12] MyEvaluations is a national database tracking system, created for Graduate Medical Education (GME) in the United States. It is used throughout Military as well as Civilian GME programs across specialties. Rotation evaluations, completed by the supervising Ob/GYN or FM attending, are also tracked on MyEvaluations. Requirements for graduation are currently, at a minimum: 40 deliveries, of which 10 must be continuity deliveries and at least 30, must be vaginal deliveries. A continuity delivery is defined as a series of encounters with a pregnant patient that includes recurrent prenatal evaluations, the management of the patient's L&D, and the follow up of the infant and mother through the postnatal/postpartum care. These minimum numbers have not been difficult to achieve in the curriculum, however the

program emphasizes that the residents should ideally experience higher numbers of spontaneous vaginal deliveries (SVD). Madigan includes additional residency training programs in Obstetrics and Gynecology (OB/GYN), Nurse-Midwifery, and Emergency Medicine. Madigan averaged around 200 deliveries per month in 2012, of which 5-10% are FM deliveries.[1]

FAMILY MEDICINE RESIDENTS

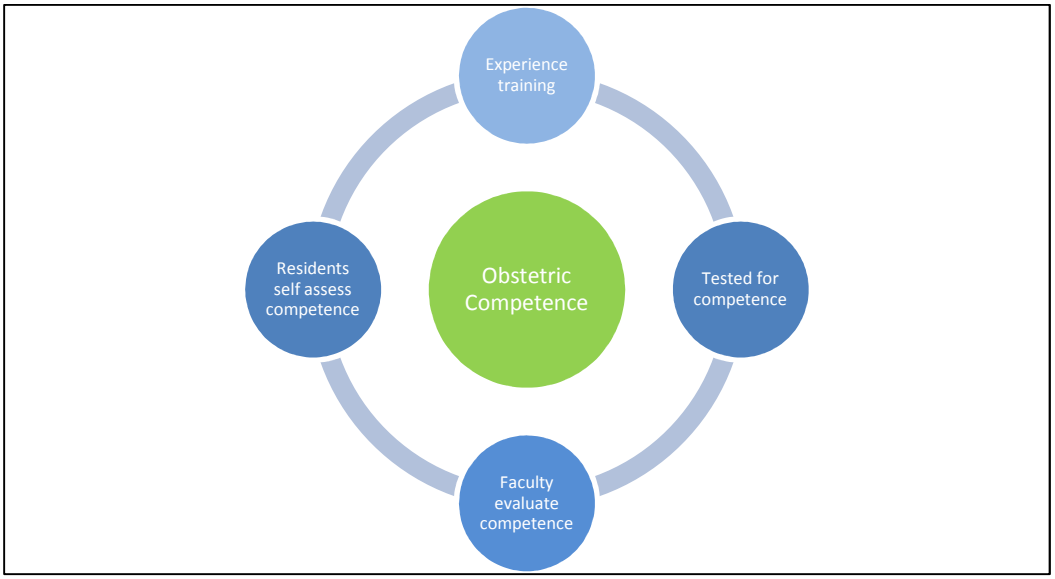
Additional factors that impact the resident's experience in training can be viewed, as described by Kern et al. as those that are predisposing, enabling, and reinforcing[13]. For example, a reinforcing factor such as a high level of interest and motivation in Maternity Care might cause residents to seek out obstetric experience. A predisposing factor might be that a female patient might seek female residents for their Maternity Care, therefore leading to higher exposure to obstetrics among female residents. The residents work together on a team. If one resident has early competence in obstetric care, this might enable them to take on more of the Maternity Care responsibilities of the team. Attending physicians might have significant influence on the resident experience. An OB/GYN attending's teaching to a FM resident is limited to when that resident spends time with the OB/GYN service, usually in four week segments. The FM residency faculty, on the other hand, will teach longitudinally and as residents experience continuity deliveries. The continuity approach of following a patient through their pregnancy and for their delivery is not unique to FM, but it is a cornerstone of the patient and physician's experience.

Figure 4 is a concept diagram of factors that may influence the development of competence in a FM resident. Additional variables may exist as perceived deficiencies and needs, as well as the following barriers:

1. FM residents must compete with residents and students for the same deliveries;
2. FM residents must maintain continuity requirements for their panel of patients;
3. FM residents must maintain a high number of outpatient clinic numbers.

[1] Source: L&D Log, Madigan Department of OB/GYN

Figure 4: Concept Diagram, Factors That May Influence Obstetric Competence FM residents



FM residents are required to develop proficiencies in cognitive, affective, and psychomotor skills. The AAFP clarifies the Program Requirements recommending that the resident can do each of the following by graduation from residency:[14]

1. Perform a normal cephalic delivery
2. Inspect the vagina, cervix and uterus
3. Perform a perineal repair (1st through 3rd degree) with assistance
4. Elicit an appropriate obstetrical history in the antepartum and laboring patient
5. Counsel women regarding nutrition, exercise, health maintenance, high risk behaviors, and preparation for pregnancy and child birth.

ARMY FM RESIDENCY FACULTY

An editorial by Moir describes that only about 69% of FM residents feel that they had received enough training in Maternity Care.[15] The same editorial describes similar surveys where only about 16% of family physicians practiced obstetrics after graduation from residency[15]. This is data from civilian family physicians. Military family physicians may practice obstetrics immediately after residency due to assignments in remote locations. That being said, military family physicians can also be assigned to clinical,

operational, or administrative positions where they are not able to practice obstetrics, and skills can deteriorate.

A recent informal poll of military family physicians assigned to remote Army Community Hospitals revealed that three of the thirteen supported Maternity Care provided by the family physicians. This anecdotal data needs to be validated. The faculty of Army FM residencies is a mix of civilian and active duty family physicians, all of whom are expected to supervise the residents' obstetric experiences. Because of the factors described (assignments to operational or administrative positions), the level of competence and interest in obstetrics among the faculty may be a variable.

FM MATERNITY CARE CURRICULUM POLICY

In 2008, the Association of FM Residency Directors (AFMRD) met and issued a call for a change to the Maternity Care curriculum in FM Residencies[16]. This preceded the Residency Review Committee (RC) for FM to the Accreditation Council for Graduate Medical Education (ACGME) initial draft change to the number of required obstetric rotations in the FM residency to increase exposure to obstetric patients, and to increase knowledge, skills, and attitudes with ante-,peri-, and postpartum patients[2,16]. The initial proposed changes were understood to be implemented in all residencies by July 2013 and might have offered a tiered structure like that described by Mazzone et al., but specified that the minimum number of deliveries for graduation would be 80.[8] In the Madigan FM residency, obstetric exposure has been limited by some of the barriers described previously, namely competition with other learners, personal feelings about Maternity Care, and variability in teaching styles among faculty. As a result, the numbers of required continuity and spontaneous vaginal deliveries for Madigan residents seemed to be more difficult to achieve in recent years. This was the original impetus to this curriculum evaluation. The Madigan FM residency program could be cited for not achieving the 80 deliveries per resident without a change to the curriculum. Abercrombie described in 2008 that "Maternity Care is the most frequently cited curricular area noted by the RRC-FM. The RRC-FM issued an average of 6.6 citations per program."[17] Madigan had never received a citation related to Maternity Care program requirements. The program did not want to risk compliance with the proposed

recommendations and requirements for Maternity Care so, in June 2012, the program proactively added a PGY3 rotation in L&D at a local community hospital to the curriculum.

In March 2013, a draft of the proposed Program Requirements was submitted by the FM RC to the ACGME. This draft listed NO requirements (as listed in the Introduction) for minimum continuity or spontaneous vaginal delivery numbers.[3] As a result the additional PGY3 L&D rotation was removed from the Madigan FM residency curriculum. The rotation's potential delivery numbers for the residents were no longer needed according to these most recent requirements.

MEDICAL APPLICATION AND MILITARY RELEVANCE:

Family physicians, especially in the military, need to provide competent Maternity Care services to healthy women and their families as part of the full spectrum of the specialty. FM residents, therefore, need to be well trained in Maternity Care to be competent family physicians. The concept of developing competence in Maternity Care in FM is not well understood. The FM RC, as described above, is in the process of revising its Maternity Care common program requirements for FM residencies. As a result, this curriculum evaluation may have timely application to military and national policy development. Additional exploration is needed regarding the role of competence in Maternity Care in family physicians. The underlying philosophy, paradigm, and framework of Maternity Care training in FM may best be explored through qualitative methodology because it provides a means for a deeper understanding of the holistic context within which a research problem develops.

PURPOSE

This study aims to pilot a concurrent mixed method design (quantitative and qualitative) for curriculum evaluation applied to the Madigan FM Residency's Maternity Care Curriculum. Using resident data from multiple sources, descriptive data and statistics were collected in order to evaluate the FM residency's achievement of its Maternity Care curriculum objectives and key components established by the 2007 and 2011 ACGME Program Requirements for FM[1]. In addition, insights gained from semi-

structured interviews of the cohort of current and recently graduated residents were used to further examine the residents experience in the Maternity Care curriculum. It is an Institutional Review Board (IRB) exempt study approved by the Madigan Department of Clinical Investigation and the University Of Washington IRB. The work described here was performed to fulfill the requirement for Masters of Public Health thesis and degree for the primary author.

METHODS

LITERATURE SEARCH

A literature search of PubMed was completed in May 2012- July 2012 that included the following search terms and Boolean relatives: “FM”, “residency”, “obstetrics”, “curriculum”, “competence” and “ACGME”. Follow up literature search was completed in March 2013 that included the same search terms, as well as additional search terms: mixed methods, qualitative, evaluation. As an additional method, a hand search of all editions from January 2012- March 2013 was performed of key journals: Academic Medicine, Journal of the American Board of Family Medicine, Family Medicine, and Annals of Family Medicine.

QUANTITATIVE AND QUALITATIVE STUDIES

SELECTION OF SUBJECTS

A convenience sample was used, consisting of the current Madigan Army Medical Center FM residents, numbering 18, a cohort of 2013, 2014, and 2015 Madigan FM residency graduates, as well as four out of the five Madigan FM residents who graduated in 2012. The residents were contacted, initially as a group, then individually, by the primary researcher to participate in the interview. The graduates were contacted via email request by the primary researcher to complete their interviews.

INCLUSION AND EXCLUSION CRITERIA

Participants were in the Madigan FM residency, including the current residents, graduates in 2013, 2014, and 2015, and previous residents who graduated in 2012.

Because this is a curriculum evaluation, the residents were the focused population. One graduate was not able to be contacted for interview due to his deployed location in support of Operation Enduring Freedom.

CURRICULUM EVALUATION QUESTIONS

1. What are the number of resident procedures and rotations in the curriculum? Are the numbers of resident procedures adherent to the Program Requirements?
2. Does the curriculum develop perceived and measured competence and confidence among FM residents graduating from the Madigan FM residency?
3. What is the experience of the residents in the curriculum?

STUDY DESIGN

The answers to these questions are inductive and deductive; quantitative, as well as exploratory. The final evaluation design evolved from the background analysis described in the introduction, as well as from the author's pragmatic worldview as described by John Creswell. The pragmatist focuses on "actions, situations, and consequences rather than antecedent conditions. There is a concern with applications – what works-and solutions to problems."[18] The research method that best addresses these questions and within a pragmatic worldview is the concurrent mixed method strategy. Quantitative and qualitative methods then together can provide complementary perspectives to help answer the research questions. Creswell defines qualitative research as "a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem," and quantitative research as "a means of testing objective theories by examining the relationship among variables."[18] The qualitative methods specifically recognize and try to describe the context within which a research problem develops. Mixed methods design provides the flexibility for exploring the best understanding of the problem.

The curriculum evaluation, therefore, used quantitative and qualitative methods. The quantitative methods included census and performance data retrieved through retrospective review from previously existing sources, statistical analysis, and statistical interpretation. The qualitative methods included data collected through open ended

questions in semi-structured interviews completed from December 2012 through February 2013 with the current and graduated residents. The qualitative method of analysis was through text analysis and the development of themes. The specific method for the thematic analysis was described by Braun and Clarke.[19] These were completed concurrently in accordance with the mixed method strategy.

Review of academic FM literature reveals that qualitative methods have been used in curriculum evaluations since about 1997 when Borkan etal proposed the qualitative method for the evaluation of FM residencies.[20] Also in 1997, Taylor and Hansen, applied qualitative methods to describe successful Maternity Care programs in FM.[21] In 2009 and 2010, Bahl etal completed two separate qualitative analyses in order to develop methods of determining required skill components of low cavity non rotational vacuum delivery and forceps deliveries.[22,23] The most similar qualitative curriculum evaluation to this study was written by Koppula etal and was completed in a Canadian FM program.[24] They used focus group interviews and content analysis to describe the experience of their residents in obstetric training. The studies that included qualitative methods described that the approach provided a deeper understanding of the context of the experiences, which helped them develop underlying reasons for the experiences. The quantitative approach was important for answering the deductive, closed-ended questions. General references for the development of this methodology included Kern's book, *Curriculum Development for Medical Education,* and the CDC's *Framework for Program Evaluation in Public Health* by Milstein etal.[13,25]

Quantitative curriculum evaluations specific to Maternity Care in FM were generally limited to the evaluation of an innovation in the curriculum and didn't incorporate formal qualitative methodology, though qualitative information was elicited through the evaluation, just not formally analyzed. Helton etal, Eidson-Ton etal, and Chang Pecci et al. describe interesting curriculum evaluations that involved descriptive analyses of procedures and survey methodology, but did not include qualitative methods.[7,26,27] Based on a review of the academic FM literature, this mixed methods curriculum evaluation design appears to be novel.

LOGISTICAL CONSIDERATIONS

Complete proposal and approvals for IRB Exempt status were received through Human Subjects application to Madigan Army Medical Center IRB in November 2012 and the University Of Washington IRB in November 2012. Excel and SPSS databases were created to summarize and de-identify the quantitative data from each of the 22 residents. Interviews for all of the 18 current residents were voice recorded through the Madigan dictation service by using a speaker phone during the interview. At no point during the recording was the resident identified. The Madigan dictation service transcribed these 18 interviews. Two of the graduate interviews were voice recorded on audio equipment and transcribed by the primary author. Two of the graduate interviews were completed via email due to connectivity concerns in their deployed locations. The de-identified transcripts were uploaded to the ATLAS.ti7 qualitative software where the coding of each transcript was completed by the primary author. Secondary review and coding of six transcripts was completed by the FM Residency Program Director (PD), who helped validate the coding "field manual" through meetings with the primary author for discussion about the coding scheme.

DATA COLLECTION PROCEDURES

Quantitative Studies: Quantitative data sources consisted of all previously existing data. They were ITE scores from the ABFM Resident Training Management System (RTMS) database for Graduate Years 2007-2015, numbers of procedures from the My Evaluations online database for Graduate Years 2006-2015. The transcribed interview content was a newly collected data during this study for Graduate Years 2012-2015. The data collection points were collected by individual, de-identified, and analyzed by graduate year (2006-2015). The following data was collected:

1) Number of Maternity Care Rotations
2) Number of Spontaneous Vaginal Deliveries (SVD)
3) Number of Operative Vaginal Deliveries (forceps or vacuum assisted) (OVD)
4) Number of First Assist C-sections (FACS)
5) Number of Continuity deliveries
6) ITE Scores for overall and female specific subjects

Qualitative Studies: A standardized, audio recorded interview consisting of thirteen questions with each of the 22 current and recently graduated residents was completed. De-identified transcription of the interviews was completed, followed by thematic analysis to develop clusters of meaning. These clusters of meaning were used to describe themes, which helped to evaluate the curriculum, as well as to describe the experience of competence development in this group of residents.

The first four questions in the interview were demographic survey questions regarding the resident's age, gender, race, and family descriptions. The remaining ten questions addressed the curriculum evaluation questions and are listed in Figure 5. The entire questionnaire is included in Appendix A.

In order to answer each evaluation question, the design organized quantitative and qualitative approaches to the questions.

1. *What are the number of resident procedures and exposures in the curriculum? Are these numbers compliant with the Program Requirements?*

The quantitative design to answer this question consisted of a retrospective review of previously existing procedure numbers through the MyEvaluations online database from 2006-2012. Additional quantitative data was collected during the interview with the following five questions:

1. How many Maternity Care rotations have you done in medical school and residency?
2. How many spontaneous vaginal deliveries have you done in medical school, residency, and after residency?
3. How many vacuum or forceps vaginal deliveries have you done in medical school, residency, and after residency?
4. How many times have you been first assist or primary surgeon for a caesarean section in medical school, residency, and after residency?
5. If the participant has graduated from residency: Do you practice Maternity Care in your current duty assignment?

Question # 5 was modified to help determine the current residents' plans for practicing obstetrics after residency. The military assignment process does not guarantee that graduates will have a job that meets their practice preference especially in obstetrics, but the residents still had a variety of preferences about practicing obstetrics after residency. This consideration was important as residents considered how much to invest in their Maternity Care training in residency.

2. Does the curriculum develop perceived and measured competence and confidence among FM residents graduating from the Madigan FM residency?

The quantitative design to answer this question consisted of analyzing In Training Exam (ITE) scores in specific Maternity Care sections from 2007-2012. The data was collected from the ABFM RTMS database, and batched by the FM Residency Program Director (PD) for analysis. The qualitative design consisted of five questions in the residents' interview:

1. Describe what obstetric competence in FM means to you.
2. Describe how you feel about providing obstetric care in FM.
3. Describe what has made you feel competent to provide independent obstetric care as a family physician.
4. What will make you feel competent to provide independent obstetric care?
5. Describe some of your barriers to obstetric competence in FM.

3. What is the experience of the residents in the curriculum?

This is a purely qualitative question and actually was added after the interviews were completed. The experience of the residents in the curriculum became an important theme in the analysis and needs to be isolated from the competence development experience in order to best evaluate the curriculum.

Figure 5: Non-Demographic Interview Questions

Interview Questions (Non Demographic):
1. How many Maternity Care rotations have you done in medical school and residency?
2. How many spontaneous vaginal deliveries have you done in medical school, residency, and after residency?
3. How many vacuum or forceps vaginal deliveries have you done in medical school, residency, and after residency?
4. How many times have you been first assist or primary surgeon for a caesarean section in medical school, residency, and after residency?
5. If the participant has graduated from residency: Do you practice Maternity Care in your current duty assignment? IF they had not graduated from residency: how do you plan to incorporate Maternity Care into your practice after graduation?
6. Describe what obstetric competence in FM means to you.
7. Describe how you feel about providing obstetric care in FM.
8. Describe what has made you feel competent to provide independent obstetric care as a family physician.
9. What will make you feel competent to provide independent obstetric care?
10. Describe some of your barriers to obstetric competence in FM.

DATA ANALYSIS

Data Analysis Software: SPSS, Excel, and Atlas.ti7 were used.

QUANTITATIVE DATA

A database called MyEvaluations is the primary procedure tracking mechanism for residents and program directors at Madigan Army Medical Center. This database, as well as survey information from the resident interviews was used to collect the following variables by individual. These data were then entered into a de-identified SPSS database. In order to best describe the data, means with standard deviations, minimums, and maximums were calculated. The difference in the means was accomplished through a One-Way ANOVA test, Fisher's Exact Test, Pearson 2-sided Chi-Square test, paired samples t-test, or multivariate test of repeated measures depending on the variable.

Primary outcome variables

1. Mean number per academic year (July-June) of spontaneous vaginal deliveries (SVD) by Graduate Year (2006-2015), with analysis of 2006-2013 only.
2. Mean number of Maternity Care rotations by Graduate Year (2012-2013)

Secondary outcome variables

1. Mean number per academic year of vacuum assisted vaginal deliveries by Graduate Year (2006-2015)
2. Mean number per academic year of forceps assisted vaginal deliveries by Graduate Year (2006-2015)
3. Mean number per academic year of first assisted caesarean deliveries by Graduate Year (2006-2015)
4. Mean ITE score (overall and female specific sections) by Graduate Year (2007-2015)
5. Proportion of graduates who practice Maternity Care in 2012 Graduate Year

QUALITATIVE DATA

This curriculum evaluation used semi-structured, audio recorded, approximately 30 minute interviews consisting of the thirteen questions with each of the 22 residents. The transcripts of these interviews were then analyzed through qualitative software called ATLAS.ti7,[28] and according to qualitative method described by Moustakas known as horizonalization to develop clusters of meaning and themes. [18,29] Braun and Clarke operationalized this method, called thematic analysis in their 2008 article.[19] The initial coding "field manual" was created as the primary author completed initial coding of five transcripts. Reliability was addressed by having an additional reviewer (JE) code the transcripts for the significant statements and formulated meanings that developed. The reviewers (AC and JE) completed an iterative process to develop a coding field manual, which can be seen in Appendix B. The coding analysis in ATLAS.ti7 allows for organization of codes by similar neighbors and networks connected through common codes and quotations. This analysis develops "bubbling thoughts" and "sparkling ideas", or themes, which are then used in a textural description of the experience in the curriculum and the experience of developing obstetric competence in a FM resident.[30] Creswell recommends, as part of the methodology, a description of the author's experience, in order to acknowledge the author's context and experience in an effort to "bracket" their experience. Validity was addressed, as Creswell recommends, through verification and then validation. Verification included the literature search, adherence to the qualitative method, bracketing the author's past experiences, and interviewing until

the saturation of data is achieved. Validation included having data analysis influenced by an experienced qualitative researcher (AT), as well as checks by a second reviewer (JE).[18]

SAMPLE SIZE ESTIMATION

This curriculum evaluation was a pilot study and the sample was one of convenience: current and recently graduated residents from the Madigan FM residency. This population was sufficient to reach saturation during the interviews, even with its small sample size, there was a fair amount of overlap in the responses and many of the residents provided similar answers to questions.

QUANTITATIVE RESULTS

QUANTITATIVE QUESTIONS

1. What are the number of resident procedures and rotations in the curriculum? Are the numbers of resident procedures adherent to the Program Requirements?
2. Does the curriculum develop perceived and **measured** competence and confidence among FM residents graduating from the Madigan FM residency?

DEMOGRAPHICS

Table 1 summarizes the demographic information for the study sample for all Madigan FM residents graduating in years 2012-2015. Only 22 residents completed the interview because 1 graduate was unavailable due to deployment to Afghanistan.

Table 1: Characteristics of the study sample (n = 23)

	Total (n=23)	Grad 2012 (n=4)	Grad 2013 (n=6)	Grad 2014 (n=5)	Grad 2015 (n=7)	**p value***
Age (year range), n, (%)						0.012
20-29	17 (73.9)	0 (0.0)	5 (83.3)	4 (80.0)	6 (85.7)	
30-39	6 (26.1)	5 (100.0)	1 (16.7)	1 (20.0)	1 (14.3)	
Gender, n, (%)						0.993
Male	16 (69.6)	4 (80.0)	5 (83.3)	3 (60.0)	4 (57.1)	
Female	7 (30.4)	1 (20.0)	1 (16.7)	2 (40.0)	3 (42.9)	
Race, n, (%)						0.864
White	15 (65.2)	3 (60.0)	4 (66.7)	3 (60.0)	5 (71.4)	
Black	3 (13.0)	1 (20.0)	1 (16.7)	0 (0.0)	1 (14.3)	
Asian/Pacific Islander	4 (17.4))	1 (20.0)	1 (16.7)	1 (20.0)	1 (14.3)	
Other	1 (4.3)	0 (0.0)	0 (0.0)	1 (20.0)	0 (0.0)	
Family Status, n (%)						0.719
Single/Divorced, no kids	6 (26.1)	0 (0.0)	3 (50.0)	1 (20.0)	2 (28.6)	
Single/Divorced, kids	1 (4.3)	0 (0.0)	0 (0.0)	0 (0.0)	1 (14.3)	
Married, no kids	7 (30.4)	1 (20.0)	1 (16.7)	2 (40.0)	3 (42.9)	
Married, kids	9 (39.1)	4 (80.0)	2 (33.3)	2 (40.0)	1 (14.3)	

*Fisher's exact test, depending on cell size

The demographic data reveal that the study sample (Madigan FM residency graduates from 2012-2015) are 70% male and 30% female; 74% are age 20-29 and 26% are age 30-39. They are 65% White, 13% Black, 18% Asian, and 4% Other Race. The family demographics reveal that 26% of the residents are single or divorced with no children, 31% are married with no children, 39% are married with children, and 4% are single or divorced with children. Overall 70% of the residents are married, and 57% of the residents have no children. A Fisher's exact test was used to test the difference between the Graduation Year groups because of small cell sizes. These data are graphically represented in Figures 6, 7, 8 and 9.

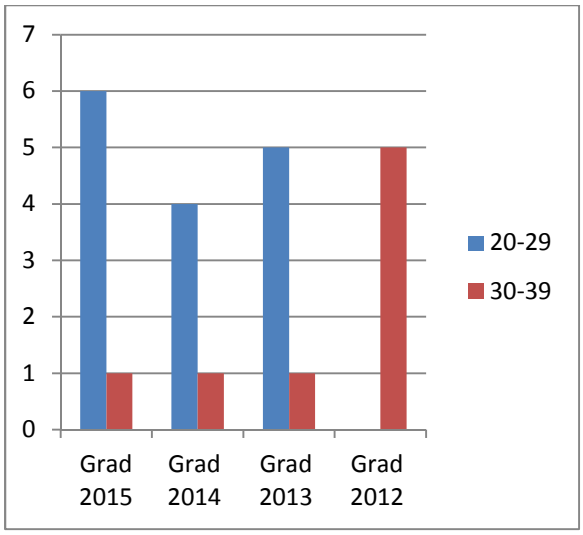


Figure 6: Madigan FM Age Demographics

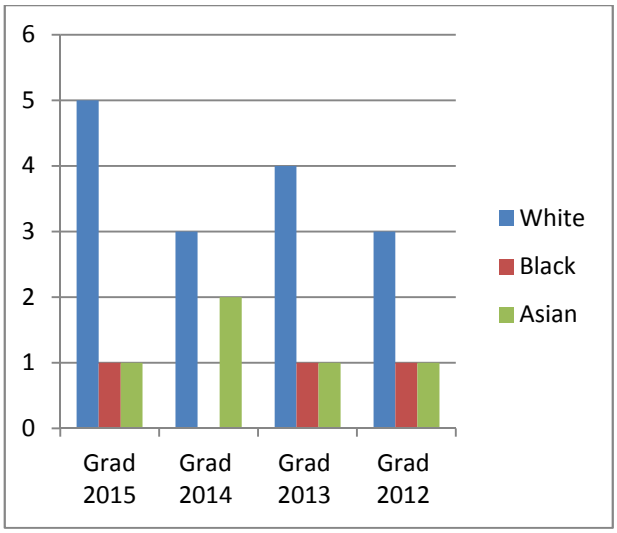


Figure 7: Madigan FM Race Demographics

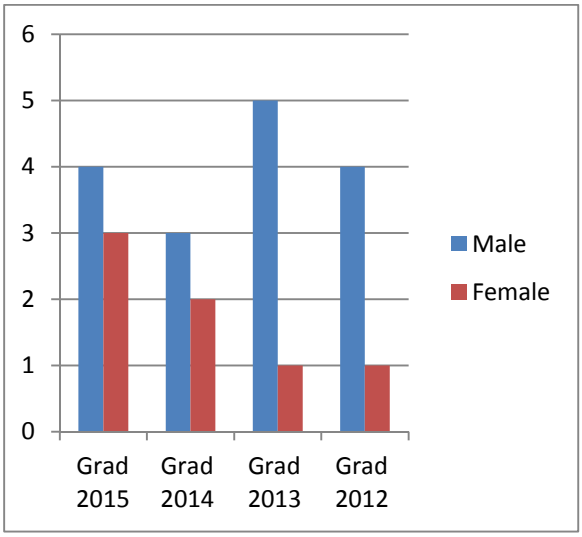


Figure 8: Madigan FM Gender Demographics

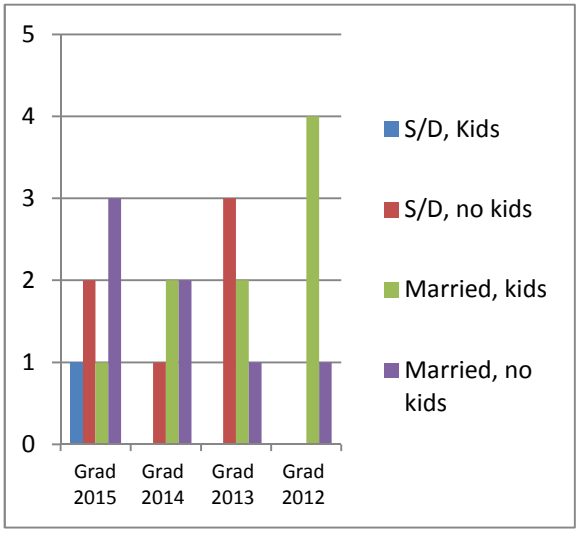


Figure 9: Madigan FM Family Demographics

PROCEDURES

The mean number of spontaneous vaginal deliveries (SVD) for Graduates 2006-2013 was 63 with standard deviation of 18. Primary outcome data are summarized in Table 2 and consist of mean number, per class, of SVD, operative vaginal deliveries, (vacuum or forceps OVD), continuity deliveries, and first assist, Caesarean section (CS) with standard deviations, minimums, and maximums. This data includes graduates from 2006 through 2015. A one way ANOVA test was used to compare means. The mean SVD was not significantly different among the graduate years (p =0.297), but the mean

CS were significantly different among the graduate years (p=0.005). The difference among the OVD means was not calculated due to missing data for Graduate years 2006-2011. The mean numbers of SVD for graduates 2006-2013 are seen graphically in Figure 10.

Table 2: Summary Madigan FM Residency Deliveries 2006-2012

	Grad 2006	Grad 2007	Grad 2008	Grad 2009	Grad 2010	Grad 2011	Grad 2012	Grad 2013	Grad* 2014	Grad* 2015	Total	P Value**
N	5	4	6	8	4	6	5	6	5	7	56	
SVD												0.297
Mean	80.8	67.0	63.3	66.5	57.5	52.3	58.6	58.8	23.8	1.7		
SD	18.6	7.4	14.3	31.8	10.3	4.9	11.7	11.3	9.7	4.5		
Min	53	56	52	35	44	46	45	50	15	0		
Max	102	72	90	124	66	61	75^	79	40	12		
OVD^^												
Mean	---	---	---	---	---	---	0.8	1.7	0.0	0.0		n/a
SD	---	---	---	---	---	---	1.3	0.8	0.0	0.0		
Min	---	---	---	---	---	---	0	1	0	0		
Max	---	---	---	---	---	---	3	3	0	0		
C-sections												0.005
Mean	3.2	0.0	10.3	15.3	6.3	5.8	5.4	6.8	0.4	0.0		
SD	2.4	0.0	4.5	11.7	3.0	1.7	4.2	4.3	0.9	0.0		
Min	0	0	6	6	2	4	2	0	0	0		
Max	6	0	18	38	9	9	12	11	2	0		
Continuity												0.181
Mean	15.8	17.3	15.7	17.8	23.8	14.7	13.4	13.7	2.0	0.0		
SD	3.8	6.6	6.1	5.3	7.3	6.6	2.2	4.3	3.4	0.0		
Min	10	10	10	12	17	11	11	9	0	0		
Max	19	25	25	26	33	28	15	21	8	0		

*Grad 2014 and 2015 not included in overall analysis because they have not completed the residency at the time of the study.

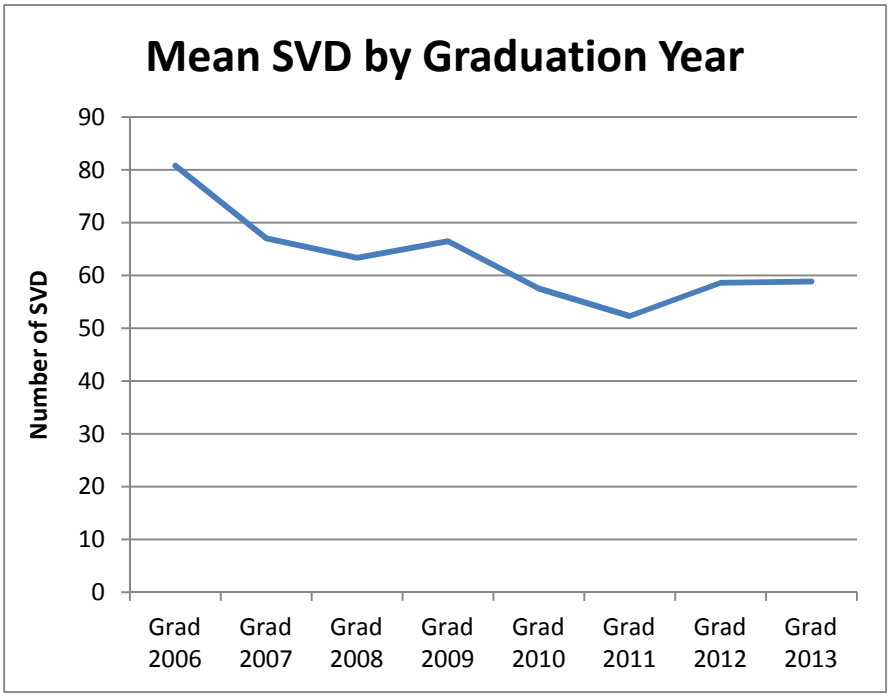
* As of 30 November 2012

**Difference between means in groups that have completed residency (2006-2012), one way ANOVA.

^ Graduate who completed an OB internship before FM residency. This maximum is inclusive only of FM specific deliveries.

^^Data available for OVD 2012-2015.

Figure 10: Mean Spontaneous Vaginal Deliveries by Residency Graduation Year



ROTATIONS

The FM residents graduating in 2013 will have completed an average of four Maternity Care rotations (PGY1 Madigan L&D, PGY2 Fort Carson L&D, PGY2 Madigan COB, and PGY3 Good Samaritan L&D). One of the graduates completed an additional elective COB rotation at Madigan in their PGY3 year.

IN-TRAINING EXAM SCORES

The ITE scores were analyzed in March 2013, after consultation with the ABFM Department of Parametrics, because the reporting of the scores changed during the period of this evaluation. The reported scores changed from average percentile score to scaled score in 2010, so comparison within and across the graduate classes was difficult. The comparison among classes is shown in Table 3 and the change in the scoring can be seen. There were significant differences between the overall ITE scores for graduate years 2007, 2008, and 2009 ($p=0.008$, 0.003, and <0.0001 respectively). No other significant differences were seen among class performance.

When class trends were observed in the Maternity Care specific section, again, the change in scoring in 2010 prevented useful analysis. The scores noted on the 2011 and 2012 ITE revealed an increase within the 2013 and 2014 graduate years, but not a difference that reached significance. Table 4 reports the Maternity Care specific scores. Figure 8 is a scatterplot that individualized those in the 2013, 2014, and 2015 graduating classes and their scores. The black arrow indicates the ABFM correlation score of 390, which approximates the score that may correlate with a passing ABFM certification score. The majority of individual scores are above 390.

Table 3: Summary Madigan FM Residency In Training Exam Scores 2007-2012, Mean (SD)

			2007*	2008*	2009*	2010*	2011^	2012^	P value**
	N	**5**	4	6	8	4	6	5	
Grad 2008	Female Reproductive	**6**	58(13)	---	---	---	---	---	
	Maternity Care		77(11)	---	---	---	---	---	
	Care of Female		53(27)	---	---	---	---	---	
	Overall		650(52)	---	---	---	---	---	
Grad 2009	Female Reproductive	**8**	51(20)	68(15)	---	---	---	---	0.771
	Maternity Care		68(10)	85(17)	---	---	---	---	0.085
	Care of Female		54(15)	58(12)	---	---	---	---	0.912
	Overall		535(49)	481(67)	---	---	---	---	0.008
Grad 2010	Female Reproductive	**4**	53(10)	68(10)	68(5)	---	---	---	0.283
	Maternity Care		60(8)	87(16)	58(15)	---	---	---	0.032
	Care of Female		58(10)	60(8)	68(5)	---	---	---	0.905
	Overall		607(71)	550(47)	660(35)	---	---	---	0.003
Grad 2011	Female Reproductive	**6**	---	57(12)	62(15)	82(17)	---	---	0.509
	Maternity Care		---	58(22)	66(9)	60(17)	---	---	0.468
	Care of Female		---	57(12)	62(17)	79(20)	---	---	0.68
	Overall		---	386(60)	468(74)	505(49)	---	---	<0.0001
Grad 2012	Female Reproductive	**5**	---	---	56(18)	80(4)	556(189)	---	0.695
	Maternity Care		---	---	63(6)	58(19)	472(240)	---	0.964
	Care of Female		---	---	58(19)	70(7)	572(141)	---	0.608
	Overall		---	---	380(64)	462(64)	486(54)	---	0.59
Grad 2013	Female Reproductive	**6**	---	---	---	76(4)	482 (120)	497(131)	0.341
	Maternity Care		---	---	---	58(20)	458(182)	563(160)	0.779
	Care of Female		---	---	---	77(14)	516 (169)	386(105)	0.776
	Overall		---	---	---	493(89)	511 (75)	561(134)	0.536
Grad 2014	Female Reproductive	**5**	---	---	---	---	482 (120)	572(144)	0.55
	Maternity Care		---	---	---	---	392 (138)	646(170)	0.142
	Care of Female		---	---	---	---	562 (75)	494(202)	0.477
	Overall		---	---	---	---	474 (13)	526(69)	0.112
Grad 2015	Female Reproductive	**7**	---	---	---	---	---	465(198)	
	Maternity Care		---	---	---	---	---	438(181)	
	Care of Female		---	---	---	---	---	381(185)	
	Overall		---	---	---	---	---	441(78)	

*Reported as mean scaled score (SD) for overall score and mean % correct (SD) for female specific section scores.

**Difference between PGY group listed by color and corresponding year and tested with ANOVA.

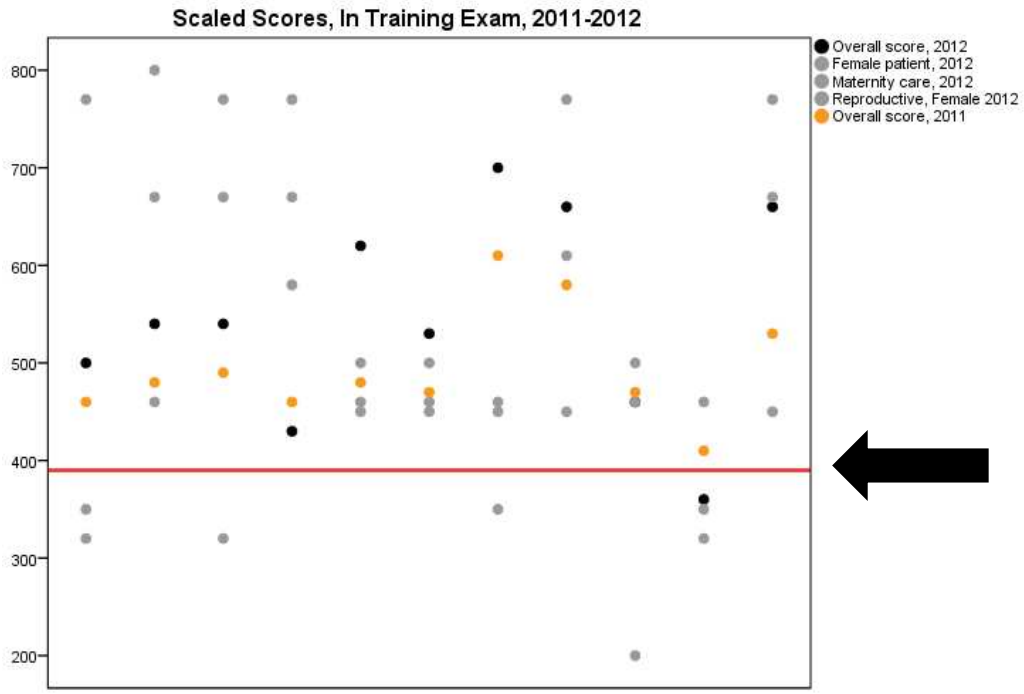
^Reported as mean scaled scores (SD).

Table 4: Trends, Madigan FM Residency Maternity Care ITE Scores 2008-2012

	2007*	2008*	2009*	2010*	2011^	2012^	P value (2-tailed)**
Grad 2008	77						
Grad 2009	68	85					0.038
Grad 2010	60	87	58				0.255
Grad 2011		58	66	60			0.722
Grad 2012			63	58	472		0.601
Grad 2013				58	458	563	0.111
Grad 2014					392	646	0.094
Grad 2015						438	

*Reported as mean scaled score (SD) for overall score and mean % correct (SD) for female specific section scores.
^Reported as mean scaled scores (SD).
**Paired Samples t-test and Multivariate test of repeated measures.

Figure 11: Scatter Plot, 2012 ITE Scores



GRADUATES PRACTICING OBSTETRICS

Four of the five graduates from 2012 were interviewed. Zero out of the four were practicing continuity obstetrics. One out the four saw obstetric patients in clinic. Two of the graduates were assigned to Army community hospitals where they assumed they would be required to provide continuity obstetric care. Their interviews revealed multiple barriers that prevented them from being involved in obstetrics. Four out of the five

graduates were deployed in support of Operation Enduring Freedom to Afghanistan with no obstetric opportunities during that time.

QUALITATIVE RESULTS: THEMATIC ANALYSIS

QUALITATIVE QUESTIONS

2. Does the curriculum develop **perceived** and measured competence and confidence among FM residents graduating from the Madigan FM residency?
3. What is the experience of the residents in the curriculum?

OBSTETRIC COMPETENCE IN FAMILY MEDICINE RESIDENCY

The first theme of obstetric competence in FM is that **the residents perceive that competence is the ability to manage the prenatal, antenatal, peripartum, and postpartum/postnatal care for healthy pregnant women and their infants**. One resident summarized obstetric competence:

> *"Obstetric competence in family medicine means that I am able to care for a woman from prior to her pregnancy with preconception counseling all the way through a full-term normal pregnancy to deliver her baby or babies as the case may be and to include her postpartum care and then hopefully care for her and the child continuing on."*

An additional theme is **the perception by the residents that obstetric competence in FM is the ability to manage unexpected complications and emergencies in the L&D (peripartum) management**. Each resident, nearly in the same sentence of describing their ability to be competent to deliver a healthy patient with a "normal" delivery, acknowledged that the ability to recognize and care for complications and emergencies are critical. One of the experiences of Maternity Care that anyone who has done obstetrics will describe is that a "normal" delivery can quickly become complicated. One resident listed possible complications: "shoulder dystocia, postpartum hemorrhage, um, difficult or sort of labor dystocias that require changes in positioning or maybe vacuum or vacuum-assisted but, that's the, and not necessarily even to be able to manage the most extreme of those situations but certainly to be able to kind of triage and take care of it initially while OB help or backup is on the way."

Another theme in the discussion of competence was **the importance of self-awareness, or the ability to gauge when and how to seek consultation**. Self-awareness is defined in psychology as a part of emotional intelligence, or the understanding of one's own knowledge, attitudes, and opinions.[31] This was not a pre-existing idea during the interviews, but statements like this continued to occur:

> *"Obstetric competence to me would be feeling comfortable with the things that you should know and understanding where that line is to where to ask for help…" and "I am able to recognize, diagnosis and care for obstetrics patients within my scope of practice and knowing when to refer to an obstetrician or ask for the assistance of an obstetrician."*

The most commonly recurring theme was that **the greater the exposure (in terms of numbers and frequency) to deliveries develops feelings of confidence and competence for the residents**. Most consistently, the residents report that "it's just the numbers" or the volume of exposures to the L&D experience that bring feelings of confidence, comfort, and competence in providing Maternity Care. Figure 13 lists a small sampling of the specific statements made about volume and repetition. This was another theme that reached saturation with the 22 interviews. As a slight nuance to this theme, those residents who were trying to increase their volume of Maternity Care exposures also seemed to have positive feelings about doing obstetrics. They would "continue to get deliveries, as many as possible, while I still have the supervision and guidance of staff physicians." These residents also consistently described the self-awareness of knowing that more exposures will continue to make them feel "more confident", especially in situations of unexpected complications or subtle improvements that might reduce perineal injuries or improve the patient's experience. Some were less convinced:

> *"I question whether I will gain as significant a rise in medical knowledge and competence during those, but I still feel that they're important; so I guess one of the principles I usually follow is the law of diminishing returns, so there is a certain high slope and then it sort of levels off, so I think that I probably will not gain as much benefit as I did, but I think that it will still be beneficial."*

The residents who had lower numbers of deliveries (less than 40 SVD) were the PGY1 or PGY2 residents. They seemed to feel "competent" to deliver a normal SVD but did not usually elaborate on their ability to deal with unexpected complications. Their answers were shorter and did not reveal additional exploration beyond the normal delivery.

THE EXPERIENCE OF MADIGAN FM RESIDENTS

Overall, the residents describe developing these feelings of competence and confidence in the Maternity Care curriculum, and these descriptions increased with the level of experience. The PGY1 expressed the most discomfort, fear, and tension about the Maternity Care experience, where most of the PGY3 reported enjoying obstetrics, especially the continuity care.

Another recurring theme was that **continuity care is a significantly positive contributor to the Maternity Care experience for FM residents.** All the residents who had completed a continuity delivery, as defined previously, described positive feelings about the experience. Many perceived that their role as a continuity provider of Maternity Care was needed and sought by patients. Two quotes reveal this:

> *"Patients who rotate or who are with us, um, like having the continuity that I think we're able to provide that other services do not provide, not that they can't but don't…" and "I think it means a lot both to us and our patients to have a consistent provider throughout prenatal care and then to ideally kind of be the delivery position. As well, I think we tend to fall on the sort of low intervention and a lot of psychosocial support, counseling, understanding of pregnancy and labor and postpartum care and I think it really helps that we often take care of the kids afterwards."*

Some residents expressed their preference was to receive their Maternity Care training from family physicians because of their focus on the continuity experience. One quote from a junior resident describes their impressions:

"I think it will be interesting to see how they (family physicians) manage deliveries and manage care a little bit better. It seems like I will like it better because it's less invasive."

An interesting theme was that the initial experience of obstetrics for residents can influence their feelings and attitudes about their Maternity Care experience in the residency. One of the residents shared an interesting analogy during their interview that was very descriptive and describes this theme. They gave permission to share it:

"If a child has a first taste of Brussels sprouts that is mushy, cold, and moldy, their preference is rarely going to be for this vegetable. If, on the other hand, the child first tastes fresh, perfectly steamed Brussels sprouts with a little olive oil drizzled over it; their preference might be that Brussels sprouts are their favorite vegetable. Obstetrics in FM is very similar."

Residents shared some of their first experiences in obstetrics and it was consistently those first experiences that influenced their preference for or against obstetrics. Here is quote from a resident who had a negative first experience of obstetrics because of uncomfortable feelings, rather than a specific experience or individual:

"My assumption is that the more deliveries I get, the more comfortable I will get and the less I will dislike obstetrics."

The residents' perception of theirs and FM's future role in Maternity Care influences their attitude about their Maternity Care experience in the residency.
As described in the introduction, the trends seem to indicate that fewer family physicians are doing Maternity Care in their post-residency practice. The unique military experience for the Army family physician includes assignments to remote locations, is used as reason to emphasize Maternity Care training in Army FM residencies. Evidence of agreement with this impression includes quotes such as the following:

"I don't think that (Maternity Care) would be an option for FM docs. You would have to go to like a Native American reservation or small rural town but still be funded by the

state or federally in order to do it, or stay in the military…" and "…depending on where I am for full scope medicine is something I may be tasked to do…."

In the interviews with the graduates from 2012, in March 2013, none of the graduates had delivered a baby since their graduation in June 2012. Three of the five had deployed to Afghanistan since graduation. One of the graduates includes continuity obstetrics as part of their clinical practice, but their L&D is only staffed by midwives and obstetricians so the family physician does not deliver these continuity patients. The experience of these graduates seems to be more consistent with civilian trends of decreasing family physicians doing Maternity Care in their post residency practice. The residents observe this reality, as well, and the possible impact on the maintenance of their obstetric competence. One resident stated that:

> *"keeping some continuity care would be really important to me to have somewhere around 10 deliveries even a year just to keep up the normal practice…."*

Many residents related an attitude of low motivation to pursue many deliveries because they do not anticipate doing obstetrics once they graduate.

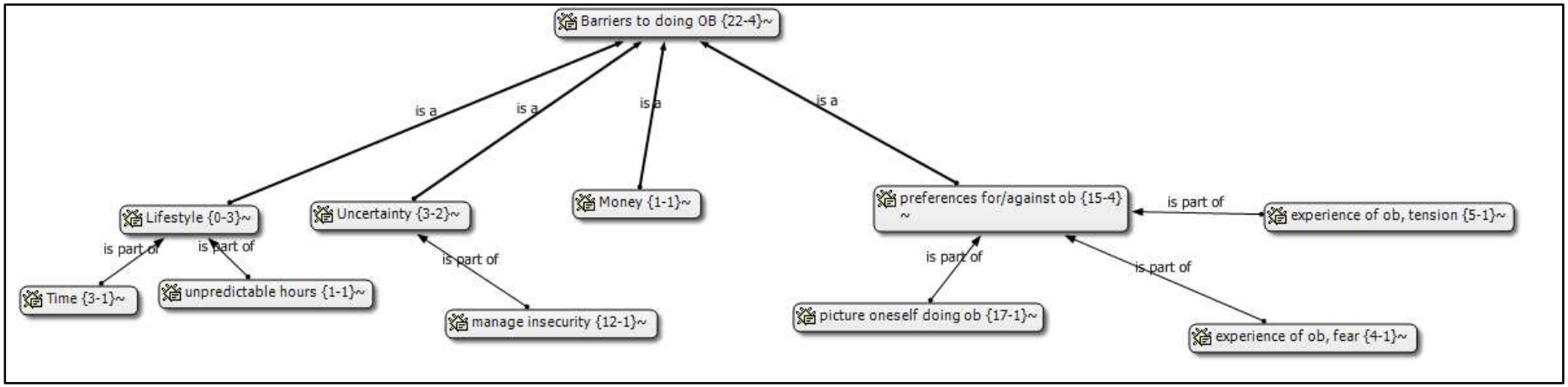
> *"Depending on where I am for full scope medicine is something that I may be tasked to do but it is not an aspect of FM that I will actively seek out."*

On the other hand, some residents described their commitment to full spectrum FM (which includes Maternity Care) because of their interest in practicing medicine in rural, urban, overseas, or other underserved areas.

> *"It's just definitely important, I think it's important because you might find yourself in a rural area or an urban area to where... it's just inconvenient for people to have to visit a variety of providers all over the place, so if you have the capability and the competence to manage not only the OB side of the house with pediatrics and the adult gynecologic issue, I think that's, I think it's important and I think from a more, just global standpoint, I think it's more sustainable in terms of having a medical system that doesn't put as much strain on the economy and strain on the patient's lives."*

Residents also perceive the additional barriers that exist that likely contribute to the decision of a family physician to do obstetrics or not. These barriers then were developed into a concept map made in ATLAS.ti7, and seen in Figure 12.

Figure 12: Concept Map, Barriers to Doing Obstetrics, ATLAS.ti7



The theme of **competition for deliveries served as a key barrier to gaining obstetric experience in the residency.** It was the most common barrier in the Madigan FM Maternity Care curriculum and reached saturation by nearly every resident referencing this barrier. A finite number of laboring and delivery experiences exist in the area around Madigan, and in the Puget Sound area as a whole. Any additional travel to locations like the Colorado rotation at Fort Carson becomes fiscally prohibitive. As a result, the residents consistently described their experience of competition and the barrier it becomes to getting deliveries. See Figure 13 for a list of significant statements. Additional barriers that were mentioned in the interviews included resident work hour restrictions, personal feelings about obstetrics, and personal motivation to get deliveries.

One theme noted was that **the learning environment that promotes autonomy with effective communication and collaboration engendered into residents a feeling of motivation of the residents in their Maternity Care experiences**. The learning environment seemed to be a common barrier for many residents. A highly tense environment seemed to impact the motivation of a learner, which then seemed to impact the number of deliveries they achieved in training. One resident described the difference in two different learning environments within the curriculum:

> *"It is a very, very different vibe between here with a residency program and nurses who are kind of hands off versus there where nurses are very much involved in helping you and working with you. It makes for a more realistic and viable kind of OB and labor progress. I think it also makes the patients more comfortable to know that there is a team taking care of them rather than just 1 person and that the nurse is just kind of there. So, I think the second rotation--I had 20 deliveries alone from that rotation--so that in itself also made me more comfortable. Having a different environment, and personally a lot less hostile environment there compared to here at Madigan, I think has helped a lot."*

Another resident described their perception of positive potential in the learning environment:

> *"I've noticed, and this isn't specific to Madigan, but there always seems to be some tension between nursing staff and providers, and sometimes even between OB and FM, so maybe getting input from one of those services and then putting it all together and, 'cause a lot of times I think it's just miscommunication or misperceived, um, opinions of others, so maybe getting that from someone in a private setting and then putting it all together might help break down some barriers, and then... And ultimately that might end up in improved patient care, so I think that would be good."*

In addition, an environment of teaching that fosters autonomy in a progressive approach seemed to be the most favorable within which to train for the residents. This observation was consistently mentioned in every interview such that we reached saturation early in the coding. A quote that exemplifies this: "the rotation in Colorado with immediately available support, but managing multiple labors, deliveries, repairs, and given the

opportunity to solely manage patients is when you really develop the most confidence." For specific purposes of the curriculum evaluation, the rotation in Colorado was mentioned by all the residents who had completed the rotation as the best experience of the residency for gaining volume of deliveries and autonomy.

A difficult theme to describe through the interview content is **the ability of a resident to recognize their influence over their experience is a critical part of their experience in the curriculum.** As an example, here is a portion of an interview, which revealed this resident's ability to recognize their role in their experience:

Researcher: So what do you think you will try and do to make yourself get even better during that rotation?

Interviewee: That is kind of a difficult rotation because nobody is really getting any numbers, unfortunately. I typically go into every rotation saying that I would really like to do OB and differentiate myself from the non-OB FM provider. So, when you do that, they tend to try and embrace you and get you to do more deliveries. That was my plan, to really emphasize how much I really do enjoy OB.

Researcher: So, that was an interesting statement that you just made, if you make yourself available as somebody who is interested in OB versus somebody who isn't interested in OB. How do you think that impacts someone's experience if they say they are not interested in OB when they go into the rotation?

Interviewee: I think people tend to forget that obstetrics is a surgical specialty and with any kind of surgeon, if you don't show interest in their specialty, then they will not take the extra mile or the extra time to try and teach you, versus if you show even a small amount of interest or really want to do it, they will kind of bring you into that circle of trust and will really go the extra mile to show you and teach you. They really do respect that and enjoy that even if that is something that you don't necessarily want to go into.

Figure 13a: Summary, Thematic Analysis, Obstetric Competence

Obstetric Competence in FM Residency	
Theme	Significant Statements
Residents perceived obstetric competence in FM is the ability to manage the prenatal, antenatal, peripartum, and postpartum/postnatal care for healthy pregnant women and their infant	“you can manage pregnant patients with minimal comorbidities such as hypertension without pre-eclampsia, gestational diabetes without insulin use.”
	“normal vaginal deliveries, 1st and 2nd degree repairs, first assisting on a C-section and then being available to do neonatal resuscitation…”
	"I have felt in our system at the very least that I can be a critical point of contact, and I can provide competent medical care and delivery care for non-complicated obstetric care and basic obstetric emergencies."
Residents perceived obstetric competence in FM is also the ability to manage unexpected complications and emergencies in the L&D (peripartum) management.	“a good family physician will be competent in the basics of any type of delivery, will be able to manage any type of complications that arise...”
	"completing the ALSO course to advance life support and obstetrics has made me feel much more comfortable in case I ever did have to manage anything."
Volume and repetition of exposures brings feelings of confidence and competence	“I know people complain about the numbers that they have to get, but in all reality, I think those numbers actually should be a little bit higher…the residents are just trying to hit the minimums rather than actually really trying to excel and exceed the minimums required.”
	"learning the ease of intervention if you think it’s going to happen, providing pre-emptive steps, providing those things that, those cases oftentimes lead you further down the pathway than you had ever gone before, at least in your mind, so.... Yes, I think that running into those cases is an important part, and no simulation... I will say no simulation, and no educational encounter outside of direct patient care can supplant that."
	“I was doing it all the time, and then, I wasn’t delivering as much, wasn’t getting my hands on…you still have to practice to keep those skills up.”
	"the most confidence, and I feel competence in providing routine, uncomplicated obstetric care, mostly because of the acuity, volume, and time spent"
	"Just more deliveries. The more practice I get delivering, I think the more competent I will feel, and just the more diversity as well, you know, seeing more deliveries being common, and kind of complications, and then learning how to manage them and feeling comfortable managing them all myself make me feel competent."
	I feel like the biggest thing to get to be to where I was is probably just the overall volume and exposure
Self-awareness, exhibited as the ability to gauge when and how to seek consultation, is a part of obstetric competence in FM	“I am able to recognize, diagnose, and care for obstetric patients within my scope of practice, knowing when to refer to an obstetrician or ask for assistance of an obstetrician.”
	"Also knowing when it’s appropriate to get help from our colleagues in obstetrics and being able to anticipate when you may need that, that help."
	"I think it’s a well-known phenomenon in medical education at least that when you get to a point where you have failed, or where you do not have the information that is necessary, you will never forget that information in the future, so... which is the reason why we practice underneath more experienced providers who, therefore, step in to provide the urgent or emergent intervention that you failed to provide, or provide guidance in performing those things."

Figure 13b: Summary, Thematic Analysis, The Experience of the Residents

The Experience of Madigan FM Residents	
Theme	**Significant Statement**
Competition for deliveries served as a key barrier to gaining obstetric experience	“they were expected to take harder cases.”
	“it was kind of trying to fight for who gets those (deliveries).”
	“L&D rotation fairly early in intern year”.
	“OB/GYN interns had priority for procedures and were more aggressive about going after procedures.”
	“competition on our floor with there being OB/GYN residents, midwife students of different forms, medical students, emergency room physicians, and FM physicians all vying for the same deliveries.”
The learning environment that promotes autonomy with effective communication and collaboration engendered motivation of the residents in their Maternity Care experiences	“the OB department, including the nursing staff has a little bit of mistrust of FM providers and kind of subtly shift the workload toward the categorical physicians.”
	“having a good ancillary staff really would build your confidence.”
	“rotation in Colorado with immediately available support, but managing multiple labors, deliveries, repairs, and given the opportunity to solely manage patients is when you really develop the most confidence.”
	"There is always an overseeing eye, and while that is an official in some circumstances, and I have alluded to the fact that I think it is essential that be available, it should not always necessarily be there actively throughout."
	"I think of the sort of stairstep progression of our training to where we are overseen completely as interns and it’s all the OB and midwife staff here at the hospital that kind of, and labor nurses too, not to discount them, that kind of see us along in those initial deliveries up to where we are kind of managing, or kind of comanaging with the attending during our second year."
	"going away to another facility at Fort Carson at Evans Army Community Health Center. That rotation has made me feel very, very comfortable with deliveries. There are no other residents there. It is not necessarily a teaching hospital. I don’t think they actually have any residency programs at all. But, it is pretty much you and the mid wife or the OB doc and the nursing staff there."
Continuity care is a significantly positive contributor to the Maternity Care experience for FM residents.	“Have the compassionate attitude to follow the patient through pregnancy especially having a good bond with the patient.”
	"I do enjoy the continuity of the delivery process and the relationships from that."
The initial experience of obstetrics for residents influences their feelings about the Maternity Care experience in the residency	"My assumption is that the more deliveries I get, the more comfortable I will get and the less I will dislike obstetrics."
	“It goes back to the issue that it’s better here as I did have one delivery with FM, and was different than my experience in medical school because it was tough for me because I didn’t have rapport with the patient, like here it’s the biggest day of their life and I’m just this guy who’s going to deliver a baby.”
The residents’ perception of their and FM’s role in providing Maternity Care in the future influences their feelings about the Maternity Care experience in the residency.	“I no longer desire to provide obstetric care unless I go to an obstetric fellowship.”
	“I have greater interest in other things.”
	“misconception by specialist and even patients that FM doctors are not competent in OB care.”
	“we have such a wide breadth of learning. In the past, it (OB) used to be a bigger part of FM, and unfortunately, it looks like it’s becoming less and less important to be part of our practice.”
	"I think it’s important because you might find yourself in a rural area or an urban area to where... it’s just inconvenient for people to have to visit a variety of providers all over the place, so if you have the capability and the competence to manage not only the OB side of the house with pediatrics and the adult gynecologic issue, I think that’s, I think it’s important and I think from a more, just global standpoint, I think it’s more sustainable in terms of having a medical system that doesn’t put as much strain on the economy and strain on the patient’s lives."
	"I am not a huge fan of obstetrics, and my future career goals don’t necessarily involve a heavy obstetrical panel."
	“One of the reasons I went into FM was because of the obstetric care.”
The ability of a resident to recognize their influence over their experience is a critical part of their experience in the curriculum.	“I just don’t want that responsibility laid on me”.
	"I learn by doing and with each delivery I become a little more comfortable managing the labor course and the delivery itself as well as the care immediately after with repairing lacerations and things like that."

QUALITATIVE RESULTS: WORD CRUNCHER

The “wordle” seen in Figure 10 is the product of a Word Cloud, which is a qualitative analysis tool that counts the number of times a word is mentioned in the project content. It then visually displays most prominently, those words based on their frequency in the transcript. For example, in the transcripts and literature analyzed for this study, the words “do”, “FM”, “care”, “comfort”, “competence”, and “confidence” were frequently mentioned. The limitation of a tool like this in qualitative software is that it reduces the analysis back into a quantitative method. The depth of the analysis of the transcripts is lost in the reduction of the content to numbers of words alone.

Figure 8: Wordle illustration of Word Cloud analysis

DISCUSSION

METHODOLOGIC OBSERVATIONS AND BRACKETING

MIXED METHODS

The qualitative information attained through this mixed methods evaluation revealed significant statements and themes about the Madigan FM residency curriculum, as well as FM as a specialty. If we had based our curriculum evaluation on only quantitative data (i.e. reviewing only numbers of deliveries, rotations, and ITE scores) , we would have confirmed that our program did achieve the Program Requirements from 2007 and from 2013. However, such an evaluation would have missed the important nuances of the experience of residents as they progress developmentally through the residency curriculum. The cognitive knowledge of FM residents increased as they improved on their ITE, and their psychomotor skills increased as they experienced the maternity experience whether through the quantity of SVD, or the quality of continuity deliveries. These knowledge and skills can be measured quantitatively. The attitude of the developing resident is evidenced through the qualitative method. If knowledge, skills, and attitudes are the educational trifecta, then curriculum evaluation must include quantitative and qualitative methods to confirm all three are being developed.[13]

LOGISTICS

An interesting observation is the amount of rich material that residents would share after the audio recorder was turned off. Much was heard about personal discomfort, opinions about obstetrics in FM, and priorities about career development during this time frame. This is an important aspect of interview and focus group methodology that must be considered so the most and best material is included for the analysis.

ATLAS.ti7 is an effective software tool for qualitative analysis, though expensive for purchase. Additional training is useful, but many tutorials are available. It seems to have potential for use in systematic reviews, as well as qualitative studies, as the material can be analyzed and organized effectively.

BRACKETING

I have spent significant time in fellowship discussing the Next Accreditation System Milestones, Emotional Intelligence, and residency training. My reviewer, Dr. Edwards, was a primary developer of the residency curriculum and is the current Program Director for the residency. We both achieved more than 100 SVDs by graduation from residency. I graduated from residency in 2006 and Dr. Edwards graduated in 2000. We are both currently practicing obstetrics as family physicians. As a result, we are both likely to have had pre-existing views associated with most themes of competence and the residents' experiences. I felt that self-awareness was one of the most important milestones in the development of competence. I observed that bracketing become the most difficult when the interview or analysis touched on these areas. I specifically observed through self-reflection that, as coding progressed, statements from residents that revealed any impression of decreased self-awareness, especially about their ability or willingness to ask for help, elicited skeptical feelings in me about the resident's competence despite their own statements about feeling competent. I enjoy the experience of self-reflection, and recognized through the process that, although I made significant effort to be objective, bias will still be present and related to my role in the research.

MATERNITY COMPETENCE IN FM RESIDENCY

Competence is obviously difficult to quantify. This mixed method evaluation reveals that obstetric competence in FM should be assessed through quantitative and qualitative measures. The ACGME Next Accreditation System (NAS) Milestones structure was recently published for FM. It uses an anchored Likert scale (1 through 5) to measure the developing competence in all areas of FM, not just Maternity Care. The anchors are a mix of quantitative and qualitative observations, depending on the milestone.[32] When considering Maternity Care competence, perhaps a scheme like Figure 9 that blends the quantification of volume of rotations and deliveries, the residents' feelings about obstetrics, the learning environment, and their self-awareness into a holistic approach to competence development.

The quantification of deliveries does not seem to have an immediate need because of the new Program Requirements. Regarding specific guidelines for numbers of deliveries perhaps residency programs could consider the following scheme to achieve their goals for training:

"Familiarity": Deliveries and continuity experiences < 60

"Comfort": Deliveries and continuity experiences equal to 60-100

"Confidence": Deliveries and continuity experiences greater than 100

Volume and repetition was obviously a key factor to developing competence. Those residents who had positive feelings about doing obstetrics spoke of trying to increase their volume of Maternity Care exposures. These residents also consistently described the self-awareness of knowing that more exposures will continue to make them feel "more confident", especially in situations of unexpected complications or subtle improvements that might reduce perineal injuries or improve the patient's experience. The residents earlier in training and with fewer deliveries seemed to feel "competent" to deliver a normal SVD but did not usually elaborate on their ability to deal with unexpected complications. For interns and junior residents with lower numbers of rotations and deliveries, this could be attributed to their developmental level and experience of full supervision. It may be that they cannot imagine the inability to do something because someone is always there to help them do it. For the senior residents, this should be rare. In my experience, the developmental transition through the PGY2 and into the PGY3, residents revisit the internal insecurity they may have felt at the beginning of the PGY1, now that they are "in charge". Through the normal PGY3 developmental process, they should now become comfortable with this insecurity, using it as a gauge for false versus true confidence, and most importantly that threshold for seeking assistance. The senior and graduated residents revealed this consistent self-awareness, which further confirms that the program is achieving this aspect of competence development.

Figure 9: Concept diagram, Factors Influencing Obstetric Competence in FM residents

OBSTETRICS IN FM

Multiple residents mentioned that their career goals included teaching and that teaching was a strong motivation to maintain their competence in obstetrics. The underlying assumption to these statements is that residency faculty must be competent in Maternity Care. Maintenance of competence in obstetrics, in particular, has been consistently difficult in the military for newly graduated residents, as described in the thematic analysis. As was described in the Introduction, the percent of family physicians who deliver babies after residency is only 10%. One resident noted that their goal was to maintain continuity care and deliveries for 10 patients per year. This seems to be a very reasonable goal, but is it enough? The time involved in continuity care, on call for the L&D, and then the actual delivery is sizeable. Would most family physicians, or more specifically FM faculty, be able to accomplish this? An informal email questionnaire as distributed among Army family physicians recently discussing these very questions. One comment provides insight into important realities:

> *"while many might not do OB after graduation, I think many will still need this skill (and we won't know which ones) for faculty and future faculty and any post (location) where FPs do OB. The most irritating FPs to have on your staff are the ones that can't cover call. We set our residents up to be 'that guy' if they can't do OB."*

The practical consequences of not maintaining competence are perceived by Army family physician leaders.

Chang Pecci et al. offer a poignant additional description of a perspective on Maternity Care and resulting innovation of multispecialty Maternal Child Health Services that achieved some success in the Boston area. She states "it is essential that some programs continue to offer opportunities for rigorous training in Maternity Care, including intrapartum services. Maternity Care results in a younger patient population in FM and ensures that we continue to care for families and patients throughout the life cycle…the model has changed family physician's role from being an extraneous provider of maternal and newborn services to one that is integral to daily operations of our hospital and community health center (CHC) network."[27] Maternal child health seems to be a commonly cited area of the American Health Care system that needs improvement. Perhaps contributing to this trend is the concern that Family Medicine as a specialty is losing its focus on taking care of the family.

LIMITATIONS

As mentioned in the Methods section, the sample size was small and limited the validity of the results. All the residents were from the same program so these results may not be generalizable to other FM residency programs. The military population and environment may limit the generalizability of the results, as well. Using the data source, My Evaluations, is subject to resident compliance with data input. The likelihood is that the numbers reported in this study may be under-reported. Anecdotal reports revealed that once residents reached the goal number of deliveries for that year group, they were less likely to update their My Evaluations procedures.

Confounders and barriers, as were described, included: work hour restrictions, the presence of competing learners, resident interest in Maternity Care content, and faculty interest in Maternity Care content. Based on junior rank and position, the answers provided by the residents may have been limited by fear of impact on their career. In an effort to mitigate this, the interviews were completed by the primary author, who is not core faculty in the residency, the residents were reassured about the interview

anonymity in the consenting process, and the study methods included de-identification of the transcripts.

Qualitative data collection and analysis of interviews has specific limitations as described by Creswell.[18] The interviews provide information that is filtered through views of the interviewees, which are a fixed pool of participants. Because of the fixed number, certain themes may not have reached saturation through the analysis. The information that is provided in the interview is within a designated context rather than through field observations. As mentioned above, the researcher's presence can bias the responses if the interviewees perceive risk. Finally, the interviews are limited to whether the interviewees can perceive and articulate their experience and environment.

CONCLUSIONS

This is an extremely timely curriculum evaluation, occurring as the RC-FM finalizing its next draft Program Requirements proposal to the ACGME. The findings from this evaluation have the potential to help design other, larger program evaluations. This study may influence the expectations of competence in FM and decisions about FM scope of practice, which ultimately may influence the overall identity of FM as a specialty. The presence of Maternity Care in FM ensures a professional identity in a Primary Care Specialty that supports the Family and Maternal-Child experience. The absence of such a holistic professional identity in the United States Healthcare System could contribute to the progressive deterioration of maternal child health in the United States. The following is a summary of the findings to our evaluation questions:

1. *What are the number of resident procedures and rotations in the curriculum? Are the numbers of resident procedures adherent to the Program Requirements?*
    - Madigan currently meets the 2007 (2011) and draft 2013 Program Requirements for Maternity Care objectives and specific components.
    - Madigan FM residency would likely be unable, in its current environment, to increase Maternity Care procedures. Competition among other learners is an important barrier to increasing numbers of procedures, especially deliveries.

2. *Does the curriculum develop perceived and measured competence and confidence among FM residents graduating from the Madigan FM residency?*
    - As the milestones are refined for the FM resident, the assessment of competence must continue to include emotional intelligence qualities such as self-awareness.
    - Competence is difficult to quantify. As mentioned above, Madigan develops measured competence based on achievement of specific key components and average to above average ITE scores.
    - The residents perceive that they develop competence as defined by the themes described in the qualitative analysis.
3. *What is the experience of the residents in the curriculum?*
    - The structure of the curriculum, as well as the program leadership will provide motivation about obstetrics that will likely impact the number of deliveries. If program leadership and the curriculum structure emphasize and embrace Maternity Care, with faculty and administration that are also aligned, and have time allocated for Maternity Care, then residents will likely have a higher motivation, which may lead to more deliveries.
    - Personal preferences for obstetric care may impact the experience of the resident in the curriculum. Many of these personal preferences develop before the beginning of residency, during positive or negative medical student experiences.
    - A medical student or FM intern should, if possible, initially experience obstetrics with positive educators in the fields of obstetrics, midwifery, or FM who will more likely provide a positive early experience.
    - Residents are very satisfied with continuity and full spectrum FM.
    - Residents affirm that FM's identity should include Maternity Care.
    - Residents prefer the FM training perspective in their training.

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REFERENCES

1. Committee FMRR. *ACGME Program Requirements for Graduate Medical Education in Family Medicine.* www.acgme.org: Accreditation Council for Graduate Medical Education;2007.
2. Committee FMRR. *Common Program Requirements.* www.acgme.org: Accreditation Council for Graduate Medical Education;2011.
3. Committee FMRR. *Draft ACGME Program Requirements for Graduate Medical Education in Family Medicine.* http://www.acgme-nas.org/family-medicine.html: Association for Family Medicine Residency Directors;2013.
4. White B. The State of Family Medicine. *Family Practice Management.* 2012:20-26.
5. Canfield PR. Family medicine: an historical perspective. *J Med Educ.* Nov 1976;51(11):904-911.
6. Chen FM, Huntington J, Kim S, Phillips WR, Stevens NG. Prepared but not practicing: declining pregnancy care among recent family medicine residency graduates. *Fam Med.* Jun 2006;38(6):423-426.
7. Eidson-Ton WS, Nuovo J, Solis B, Ewing K, Diaz H, Smith LH. An enhanced obstetrics track for a family practice residency program: results from the first 6 years. *J Am Board Fam Pract.* 2005 May-Jun 2005;18(3):223-228.
8. Mazzone M, Krasovich S, Fay D, et al. Implementing radical curriculum change in a family medicine residency: the majors and masteries program. *Fam Med.* 2011 Jul-Aug 2011;43(7):514-521.
9. Stewart M. Core Competencies. 2008. Accessed 25 May, 2012.
10. Zonia SC, LaBaere RJ, Stommel M, Tomaszewski DD. Resident attitudes regarding the impact of the 80-duty-hours work standards. *J Am Osteopath Assoc.* Jul 2005;105(7):307-313.
11. Williams RA. Women's health content validity of the Family Medicine In-training Examination. *Fam Med.* Sep 2007;39(8):572-577.
12. MyEvaluations. 1998-2013; https://www.myevaluations.com/.
13. Kern DE, Thomas PA, Howard DM, Bass EB. *Curriculum development for medical education, a six-step approach*. Baltimore, Maryland: The Johns Hopkins University Press; 1998.
14. AAFP. *American Academy of Family Physicians Recommended Curriculum for Family Medicine Residents, Maternity and Gynecology Care, Reprint No 261*2011.
15. Moir A. Resident confidence in obstetrics: let's get more practice. *Can J Rural Med.* 2011;16(2):67.
16. Draft of Proposed ACGME Program Requirements for Graduate Medical Education in Family Medicine. In: (RC-FM) ARCfFM, ed2012.
17. Abercrombie S, Callaway P, Carek P, et al. A process for change: a methodology for academic family medicine. *Ann Fam Med.* 2008 Nov-Dec 2008;6(6):569-570.
18. Creswell JW. *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. Second ed. Thousand Oaks, California: Sage Publications; 2007.
19. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in Psychology.* 2006;3:77-101.

20. Borkan JM, Miller WL, Neher JO, Cushman R, Crabtree BF. Evaluating family practice residencies: a new method for qualitative assessment. *Fam Med.* Oct 1997;29(9):640-647.

21. Taylor HA, Hansen GH. Perceived characteristics of successful family practice residency maternity care training programs. *Fam Med.* 1997 Nov-Dec 1997;29(10):709-714.

22. Bahl R, Murphy DJ, Strachan B. Qualitative analysis by interviews and video recordings to establish the components of a skilled low-cavity non-rotational vacuum delivery. *BJOG.* Jan 2009;116(2):319-326.

23. Bahl R, Murphy DJ, Strachan B. Non-technical skills for obstetricians conducting forceps and vacuum deliveries: qualitative analysis by interviews and video recordings. *Eur J Obstet Gynecol Reprod Biol.* Jun 2010;150(2):147-151.

24. Koppula S, Brown JB, Jordan JM. Experiences of family medicine residents in primary care obstetrics training. *Fam Med.* Mar 2012;44(3):178-182.

25. Milstein RL WSe. Framework for Program Evaluation in Public Health. *MMWR.* 1999;48(RR11):1-40. http://www.cdc.gov/mmwr/preview/mmwrhtml/rr4811a1.htm.

26. Helton M, Skinner B, Denniston C. A maternal and child health curriculum for family practice residents: results of an intervention at the University of North Carolina. *Fam Med.* Mar 2003;35(3):174-180.

27. Chang Pecci C, Leeman L, Wilkinson J. Family medicine obstetrics fellowship graduates: training and post-fellowship experience. *Fam Med.* May 2008;40(5):326-332.

28. *ATLAS.ti7* [computer program].

29. Moustakas C. *Phenomenological Research Methods*. Thousand Oaks, CA: Sage Publication Inc; 1994.

30. Friese S. *Qualitative Data Analysis with ATLAS.ti*. Thousand Oaks, California: Sage Publications Inc.; 2012.

31. Wikipedia. http://en.wikipedia.org.

32. Family Medicine Milestones & The Next Accreditation System. In: Education ACfGM, ed2013.

APPENDIX

A. Interview Questionnaire

B. Coding Field Manual

C. Madigan Human Subject's application and approval letter

D. University of Washington Human Subject's application and approval letter

E. Study Poster