

Building a Culture of Life through Evidenced-based Natural Family Planning (NFP): The Marquette System (A Panel Presentation and Discussion)

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Introduction

According to the late Pope Saint John Paul II, one of the first places to start in building a culture of life is by providing

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natural family planning (NFP) services. In his encyclical *Evangelium vitae*, (*The Gospel of Life*), he also recommends teaching all married couples NFP, having effective methods of NFP provided by health professionals, and having Catholic universities as part of this endeavor.¹

Faculty and professional nurses at Marquette University College of Nursing, Milwaukee, Wisconsin, have been offering professional services in natural family planning (NFP) since 1985. From 1985-1998 we offered a cervical mucus-based method of NFP called the Creighton Model System, or CrM. In 1998, an Institute for Natural Family Planning (INFP) was established at Marquette for the purpose of providing professional education, research, and innovative services in natural family planning and in 1999, a new method of NFP (called the Marquette Model, or MM) was developed and launched. This method entails the integration of electronic hormonal fertility monitoring along with traditional natural markers of fertility.

The purposes of this paper are to:

- Provide foundational reasons (i.e., physiological, research, and practical) for developing a new system of NFP;
- Provide evidence for the effectiveness of this new system of NFP;
- Apply this system of NFP to special reproductive circumstances; and
- Describe an NFP teacher training program.

Foundations of the Marquette Method of NFP

In the early 1980s, faculty at Marquette University College of Nursing had the intention of starting a natural family planning training program for professional nurses. Several models of NFP were explored for this purpose including the Billings Ovulation Method and the Creighton Model (CrM) System of NFP. The CrM system was chosen for Marquette since it was

its beginning by working with bilingual couples, where Spanish is their primary language, as well as English-speaking couples. Her desire to spread the word of living with one's fertility has been her drive and call. She also assists as a preceptor for other future instructors training in the Marquette Method.

¹ Pope John Paul II, *Evangelium vitae* (*The Gospel of Life*) in *Origins* 24/42 (6 April 1995), #13.

highly developed and structured. It also had a well-developed curriculum that could be replicated at Marquette, and it was associated with a sister Jesuit university, i.e., Creighton University in Omaha, Nebraska. We obtained a grant from Marquette University Religious Commitment funds to send faculty and other health professionals through the CrM NFP teacher training program.

We started offering CrM NFP services at Marquette University and area Catholic hospitals in 1985. Eventually, this author became the president of the Creighton Model Academy of Natural Family Planning and conducted an effectiveness study of the CrM system at Marquette University.² We then developed the CrM courses for college credits at Marquette and presented the proposed curriculum to the College of Nursing curriculum, but we found resistance to the idea and to the proposed courses. One problem was that a CrM NFP teacher training program would require two theory courses and two practicums. Submitting and having two theory and two practice courses for the CrM NFP teacher training program approved would be very difficult to get through the college and university system of approval. Another reason is that there are ethical requirements for providing CrM services that we were not able to meet at our university, i.e., we could not reject students enrolling for the courses and training program if they were on hormonal contraception or did not follow Catholic Church teaching on human sexuality.

Another reason for developing a new system of NFP was that the CrM system is rather complex to use and requires very intensive work for the provider. Mucus-only methods, such as CrM, are at times confusing both for the user and provider and only moderately effective in helping couples avoid pregnancy. Our CrM providers were finding early dry-mucus-day unintended pregnancies among their users and often having NFP fertility charts of users with white baby stamps on many days, indicating long bouts of abstinence.³ Subsequently, we found out that mucus-only systems can have an average of

² Fehring, R., D. Lawrence, and C. Philpot. (1994). Use-effectiveness of the Creighton Model ovulation method of natural family planning. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, 23(4): 303-309.

³ White baby stamps on NFP charts indicate fertile days, i.e., days for avoiding pregnancy and sexual intercourse.

17 days during a menstrual cycle of required abstinence for those women/couples seeking to avoid pregnancy.⁴

However, the main reason for developing a new method of NFP was to give the faculty and staff at Marquette University the flexibility to develop and research a system of NFP without having to receive permission from the developer of another system of NFP. In addition, we needed to develop an NFP teacher training program for health professionals that fit within the Marquette University system. In short, we needed the flexibility to develop our own NFP teacher training program for health professionals.

In the meantime, Marquette NFP researchers investigated other natural indicators of fertility and technology that could aid a woman in using a method of NFP. We investigated two devices that measured salivary vaginal electrical resistance. One such device, called the OvaCue fertility monitor (formally called the Cue), is sold and marketed (both in magazines and on the Internet) in the USA as a device to achieve pregnancy and for use with NFP.⁵ We also tested an older device that measured vaginal electrical resistance (called the Ovulon) and felt there was some potential for the device.⁶ However, since the OvaCue and Ovulon are invasive devices (i.e., a vaginal probe) they might not appeal to many women. Furthermore, there never has been any study with the OvaCue to determine the efficacy or effectiveness of the monitor in helping women/couples to either avoid or achieve pregnancy. European researchers also suggested that the OvaCue Fertility Monitor utilizing the algorithm on which it currently is based cannot be recommended for natural family planning.⁷

⁴ Colombo, B. (1998). Evaluation of fertility predictors and comparison of different rules. *Genus*, 54 (1998): 153–167.

⁵ Fehring, R. and N. Gaska. (1996). A comparison of the Ovulation Method with the CUE Ovulation Predictor in determining the fertile period. *Journal of the American Academy of Nurse Practitioners*, 8: 461-466.

⁶ Fehring, R., and W. Schlaff. (1998). Accuracy of the Ovulon fertility monitor to predict and detect ovulation. *Journal of Nurse Midwifery*, 43(2): 117-120.

⁷ Freundl, G., M. Bremme, P. Frank-Herrmann, S. Baur, E. Godehardt, and U. Sottong. (1996). The CUE Fertility Monitor compared to ultrasound and LH peak measurements for fertile time ovulation detection. *Advances in Contraception*, 12(2): 111-121.

Over the past twenty years numerous miniature microscope-type devices were developed and marketed for NFP. These devices are designed to observe changes in salivary ferning patterns that are purported to reflect the changes in estrogen levels from a developing follicle and hence the fertile phase of the menstrual cycle. A study in which the Lady Free Biotester was compared with the self-observation of cervical-vaginal mucus and the self-detection of luteinizing hormone (LH) in the urine.⁸ The study found there was a very strong correlation between the LH surge in the urine and the peak in self-observed cervical-vaginal mucus ferning and salivary ferning. However, there was no definable beginning and end of the fertile time based on salivary ferning patterns. We did not recommend use of these microscope devices for use with NFP.

New Hormonal Urine Testing Devices

In 1990, Carl Djerassi, one of the developers of the hormonal birth control pill in the United States, predicted that in the future women would be able to monitor their own reproductive hormones to determine the fertile and infertile time of their menstrual cycles.⁹ He called this new method “Jet Age” natural family planning. In the late 1990s, Unipath Ltd. (Bedford, England) introduced two new electronic fertility monitors to help women determine their window of fertility.¹⁰ The Persona fertility monitor was developed for women or couples wishing to avoid pregnancy and the Clearblue Easy Fertility Monitor (CBEFM) for couples choosing to achieve a pregnancy.

The Persona monitor consists of a handheld electronic device and disposable test strips that were designed to detect urinary luteinizing hormone (LH) and a urinary metabolite of estrogen, i.e., estrone-3-

⁸ Fehring, R. (1998). Evaluation of the Lady Free Biotester in determining the fertile period. *Contraception*, 57(5): 325-328.

⁹ Djerassi, C. (1990). Fertility awareness: jet-age rhythm method? *Science*, 248 (4959): 1061-1062.

¹⁰ May, K. (2001). Home monitoring with the ClearPlan Easy Fertility Monitor for fertility awareness. *Journal of International Medical Research*, 29 (Suppl 1): 14A-20A.; Genuis, S.J., and T. P. Bouchard. (2010). High-tech family planning: reproductive regulation through computerized fertility monitoring. *Eur J Obstet Gynecol Reprod Biol*, 153(2):124-30; Bouchard, T.P, and S.J. Genuis. (2011). Personal fertility monitors for contraception. *CMAJ*. 183(1): 73-76.

gluconeride (E3G) from early-morning urine samples. The monitor picks up a rising threshold level of urinary estrogen at the beginning of the fertile period and the urinary LH + 3 days surge as the end of the fertile period. The monitor displays a “green” light to indicate the infertile days and a “red” light to indicate fertile days. The Persona also has a built-in calendar formula when the LH surge is missed to determine the end of the fertile phase for those cycles. Persona is not available in the United States.

The CBEFM was also designed to identify a woman’s fertile period by tracking the changing levels of estrone-3-glucuronide (E3G), the urinary metabolite of estradiol, and by identifying the urinary surge of luteinizing hormone (LH).¹¹ The CBEFM, however, has a higher threshold level of detecting E3G levels than the Persona and thus has a shorter pre-LH phase and overall a shorter fertile phase to target the optimal days to achieve a pregnancy. The CBEFM was designed to read the result of antibody-impregnated test sticks to identify changes in the hormone levels and provide the user with a reading of “low,” “high,” and “peak” fertility. The “high” reading is triggered by the detection of rising levels of urinary E3G and the “peak” of fertility by the urinary surge of LH. At a minimum, the monitor will indicate at least one day of “high” fertility and two days of “peak” fertility. However, in a very few women the day of the estrogen rise coincides with the day of the LH surge. The user therefore goes straight from “low” to “peak”. In addition, some women may only see “low” and “high” signals, particularly if they miss tests or have an infertile and anovulatory cycle.

German researchers conducted a study to determine the accuracy of the ClearPlan Easy Fertility Monitor (i.e., an earlier name for the monitor).¹² They monitored 53 women to detect daily serum levels of LH and estradiol and employed transvaginal ultrasound to ascertain the precise day of

¹¹ May, K. (2001). Home monitoring with the ClearPlan Easy Fertility Monitor for fertility awareness. *Journal of International Medical Research*, 29 (Suppl 1): 14A-20A.

¹² Behre, H. M., J. Kuhlage, and C. Gassner, et al. (2000). Prediction of ovulation by urinary hormone measurements with the home use Clearplan Fertility Monitor: comparison with transvaginal ultrasound scans and serum hormone measurements. *Human Reproduction*, 15: 2478-2482.

ovulation. They found that ovulation occurred 97.0% of the time during a three-day period that included the two “peak” days plus the next day “high” on the CBEFM. There were no ultrasound-detected ovulations before the monitor “peak” days. They also found that in 92% of the cycles, the first “high” reading on the monitor reading coincided with the serum estradiol rise day.

The CBEFM is currently sold and marketed in the United States only for women and couples who wish to achieve pregnancy. However, the information provided by the monitor can be used inversely for avoiding pregnancy as an off-label use. To use the CBEFM monitor as a method to avoid pregnancy alone would require the use of another marker to help define the beginning of the fertile phase in those cycles that the monitor underestimates the actual beginning. Use of the CBEFM and cervical mucus monitoring together might be beneficial. Having two markers to estimate the beginning, peak and end of the fertile time could be thought of as a double check. However, a downside is that this makes the method more complex and has the risk of uncorrelated signs of fertility, e.g., the peak in mucus and the peak in LH are not correlated. Teaching couples and women how to monitor the two signs of fertility and to interpret them makes the process a lot more complex. The complexity of using both markers might also decrease the compliance with instructions and continuation of use.

Based on a recommendation from Michael Zinaman, MD, then a reproductive endocrinologist from Loyola University School of Medicine, we decided to develop a system of NFP that integrated the new technology of the CBEFM with a traditional mucus-only type method. Clinicians and researchers from Marquette and other universities, and some master NFP providers met to develop a new system of NFP called the Marquette Model or MM. The first MM system of NFP involved using the CBEFM as a second check for the beginning, peak, and end of the estimated fertile phase along with cervical mucus.

To provide a new system of NFP we developed a user manual, a menstrual cycle charting system, a registration, a follow-up, and a pregnancy evaluation form. We also created three PowerPoint sessions that included what is NFP, reproductive anatomy and physiology, how to observe cervical mucus, and how to use the CBEFM, how to chart, and how to use to avoid and achieve pregnancy. Other content in the second and third session

included how to use NFP with special circumstances (i.e., postpartum, coming off hormonal contraception, and during perimenopause). We also included marital dynamics and benefits of using NFP and church teaching on human sexuality. Developing graphics for all materials was also a challenge, since we did not want to violate any copyrights by using previous NFP materials.

Evidence for the Effectiveness of the Marquette Method(s) of NFP

Pope Saint JPII said in *Evangelium Vitae* (#96) that there should be an honest appraisal of NFP methods.¹³ Since we developed a new system of NFP, we also needed to determine how effective our system of NFP was in helping couples avoid and achieve pregnancy. In 2007, we (Fehring, Schneider, and Raviele) published the first prospective cohort efficacy study of the MM.¹⁴ The participants for this study were 195 couples who sought NFP services at five clinics in four cities (i.e., Atlanta, Madison, Milwaukee, and St. Louis). We found the correct-use unintended pregnancy rate was 2.1% per 100 users over 12 months of use, and the total unintended pregnancy rate was 14.2% over 12 months of use. We concluded that the use of this dual method of NFP can be as effective as other fertility awareness-based methods of NFP. However, comparative studies are needed to confirm this conclusion, and the effectiveness needs to improve.

In 2008 we published a retrospective effectiveness study of the MM¹⁵ and in 2009 a cohort comparison study between users of the MM and users of the CrM.¹⁶ The 2008 retrospective study involved 204 couples (i.e., women with a mean age of 28.6 and their male partners, with a mean age of

¹³ Pope John Paul II, *Evangelium vitae* (*The Gospel of Life*) in *Origins* 24/42 (6 April 1995), #96.

¹⁴ Fehring, R., M. Schneider, and Raviele, K. (2007). Efficacy of hormonal fertility monitoring as A method of natural family planning. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, 36(2): 152-160.

¹⁵ Fehring R., M. Schneider, and M. L. Barron. (2008). Retrospective efficacy of the Marquette Model of natural family planning. *The American Journal of Maternal Child Nursing*, 33(6): 348-354.

¹⁶ Fehring, R., M. Schneider, M. L. Barron, and K. Raviele. (2009). Cohort comparison of two fertility awareness methods of family planning. *Journal of Reproductive Medicine*, 54:165-170.

30.3) who were taught NFP (by health professionals, physicians, and nurses) at four sites in the United States (Saint Augustine, Florida, Atlanta, Saint Louis, and Milwaukee). The twelve-month correct use pregnancy rate was 0.6 (i.e., 99.4% survival) and the typical use (total pregnancy rate) was 10.6 (i.e., 89.4% survival) per 100 users. We concluded that, when used correctly, the MM system of NFP is a very effective means of avoiding pregnancy.

Our retrospective cohort comparison study involved couples who were taught the MM method of NFP in comparison to the CrM system of NFP. The participants for this study came from the same four clinic sites as the previous study and involved 313 couples who were taught how to avoid pregnancy with the CBEFM plus CMM and another 315 who used CrM CMM only. The researchers found a total of 28 unintended pregnancies with the CBEFM plus CMM group and 41 with the CrM CMM only group. The 12-month correct use pregnancy rate of the CPEFM group was 2.0%, and the total pregnancy rate was 12.0%, in comparison with a 3.0% correct use and 23.0%, total pregnancy rate with the CMM only group. We concluded that the MM CPEFM aided CMM method was more effective than the CrM CMM only method.

After these effectiveness studies were published, we realized that our current system of NFP (called Marquette Model I, or MMI) was still rather complex to learn, use, and teach. MMI requires three group sessions in the first three months, 15-minute follow-up sessions at the second and third month, and then a follow-up session at 6 months and 12 months of use. Furthermore, since it was a new system of NFP and we did not have many MM providers around the country, we wanted to provide greater access to this new system of NFP. To make the system easier to use and teach, we simplified the mucus ratings to Low, High, and Peak based on mucus characteristics.¹⁷ We also developed a simple algorithm for the system that applies to either the mucus ratings or the monitor levels of fertility. Our simple fertility algorithm is as follows:

17 Fehring, R. (2005). New low and high tech calendar methods of family planning. *Journal of Nurse-Midwifery and Women's Health*, 50: 31-37.

TO AVOID PREGNANCY: Do not have intercourse during fertility.

- 1. Fertility BEGINS on day 6 during the first 6 cycles; After 6 cycles of charting then**
- 2. Fertility BEGINS on the earliest day of PEAK during the last 6 cycles minus 6 days**
- 3. Fertility ENDS on the last PEAK Day plus THREE full days; After 6 cycles**
- 4. Fertility ENDS on the last PEAK Day of the last 6 cycles plus THREE full days**

We received a large federal and private foundation grant to develop a website program to teach couples the MM of NFP online and to provide online consultation, i.e., to provide ease of access. The web site was launched in 2008. This online Web based program was in the English and Spanish languages. This online site included information on NFP, user forums, an automatic menstrual cycle charting system, protocols for special reproductive circumstances (e.g., monitoring fertility during the postpartum breastfeeding transition), and online support from professional nurses and physicians. The online system of the Marquette Method enrolled over 10,500 women at that site. Up until Mary of 2015, these services were provided free of charge, even though they required 30 minutes to three hours per day of professional consultation.

The Marquette University College of Nursing NFP web site also had free information on fertility, a short instructional video, downloadable digital menstrual cycle charting systems, access to protocols for special circumstances (e.g., using NFP while breastfeeding), instructions on how to observe and chart natural indicators of fertility, and instructions for achieving and avoiding pregnancy. A unique aspect of the information section of the web site was a one-page simple Quick Start Instructions that can be read in five minutes and allows the user to begin charting and use a NFP method. Women who register on the web site have access discussion forums and consultation from professional nurse NFP teachers, an obstetrician gynecologist with expertise in the use of NFP, and a bioethicist. The online charting system also notified the user of possible health problems, including

unusual bleeding, infertility, pregnancy, and cycle dynamics that are out of the norm.

Two professional nurses managed the online program and visited the online site every day to answer questions in the online forums, to provide one-on-one private consultation with participants, and to monitor the site for inappropriate responses. Forum and private questions were answered within 24 hours of being posted. The nurses also notify the web site physician consultant or bioethicist when questions are directed towards their expertise. The web site was periodically updated by the nurses with research on fertility, suggestions on how to manage health problems like polycystic ovarian disease, and how to optimize fertility.

The online charting system has designated sections for recording the results of either the CPEFM or self-observed cervical-vaginal mucus or both (as estimates of the fertile phase of the menstrual cycle) and provides spaces for recording the results as either L = low, H = high, or P = peak fertility. The charting system provides a pop-up window for the user that illustrates the three fertility levels provided by the fertility monitor or the cervical-vaginal mucus observations. The charting system also has a place to record menses on a scale of 1-3 with 1 = light; 2 = moderate; and 3 = heavy menstrual flow and a row for recording acts of intercourse (= I). The top of the chart has room for recording intention of use (to achieve or avoid pregnancy) for each cycle. The charting system automatically indicates (in light blue) the fertile phase (based on a built-in fertility algorithm) as the user charts. There is no guessing as to whether the day is either fertile or not.

In 2011 we published a pilot study to determine the effectiveness of the web site system in helping women avoid pregnancy and found that among the 217 users avoiding pregnancy, there was 1 unintended pregnancy with correct use (98% survival rate) and 9 total unintended pregnancies providing a typical use survival rate of 89%. For those achieving pregnancy (N=38) the 6 months pregnancy rate was 60%.¹⁸ We concluded that the online NFP system seems to provide adequate acceptability and the ability to meet pregnancy intentions comparable to in-person teaching of NFP methods.

¹⁸ Fehring, R, Schneider, M, & Raviele, K. (2011). Pilot Evaluation of an Internet-based Natural Family Planning Education and Service Program, *Journal of Obstetrics, Gynecology, and Neonatal Nursing*, 40(3): 281-291.

We then published the first randomized comparison of two Natural Family Planning (NFP) methods since the 1980s.¹⁹ The aim of this study was to compare the efficacy and acceptability of two Internet-supported fertility awareness-based methods (FABM) of family planning. This study involved recruiting 667 women and their male partners and randomizing them into either the CBEFM group or a cervical mucus monitoring (CMM) group. We discovered that the CBEFM participants (N=197) had a total pregnancy rate of 7 per 100 users over 12 months of use compared with 18.5 for the CMM group (N=164). We concluded that in comparison with the CMM, the CBEFM aided method of NFP was more effective. All users had an increase in acceptability over time, but the results are tempered by the high drop-out rate.

The efficacy and effectiveness studies of the MM system of NFP for avoiding pregnancy are based on use of NFP through twelve months or twelve to thirteen menstrual cycles of use. However, Trussell has pointed out that effective methods of family planning and those that require behaviors for effectiveness will have multiplying un-intended pregnancy rates over time.²⁰ Therefore, we sought to determine and compare the extended use effectiveness (i.e., at 12 and 24 menstrual cycles of use) of the MM online system of NFP among women (and subgroups of women) seeking to avoid pregnancy.²¹ We found among 710 non breastfeeding women there were 2 unintended pregnancies per 100 at 24 cycles of correct use and 15 pregnancies at 24 cycles of typical use. However, the 225 women using the CBEFM had a typical use unintended pregnancy rate of 6 at 24 cycles of use in comparison with the 129 women using CMM that had a typical use pregnancy rate of 19 at 24 cycles and with the women (n=357) using both CMM+CBEFM that had a pregnancy rate of 18 at 24 cycles of use. We concluded that our online fertility education system provides adequate ability

¹⁹ Fehring, R., M. Schneider, K. Raviele, D. Rodriguez, and J. Pruszynski. (2013). Randomized comparison of two Internet-supported fertility awareness-based methods of family planning, *Contraception*, 88(1): 24-30.

²⁰ Trussell, J. (2011). Contraceptive failure in the United States. *Contraception*, 83(5): 397-404.

²¹ Fehring, R., and M. Schneider. (2017). Extended effectiveness of an online natural family planning service program. *MCN The American Journal of Maternal Child Nursing*, 42(1): 43-49.

to meet pregnancy intentions. Use of the CBEFM to estimate the fertility among non-breastfeeding women provides the most secure method of avoiding pregnancy.

Applying the Marquette Model of NFP to Special Reproductive Circumstances

The Marquette University web site NFP system also facilitated studies to determine the effectiveness of special protocols for postpartum women,²² effectiveness to avoid pregnancy among women transitioning through perimenopause,²³ and the effects of focused intercourse during the estimated fertile window with couples wishing to achieve pregnancy.²⁴ In addition, the web site facilitated the provision of women's health beyond family planning in that the professional nurses managing the Web site and user forum answer many related health questions (e.g., assessing and managing polycystic ovarian syndrome and unusual uterine bleeding) with over 20,000 posts. In essence these studies demonstrated that the online NFP Web site was a system of providing women's health care and the use of the menstrual cycle as a vital sign.

Postpartum Breastfeeding

Use of NFP during special circumstances, especially postpartum breastfeeding can be very difficult. During the postpartum breastfeeding transition to fertility, there is a great variability among women in the time to return to fertility from about 2 months to well over 12. The natural signs of fertility, and in particular mucus observations and basal body temp changes are difficult to use and sometimes useless. Current methods of NFP do not

²² Bouchard, T, M. Schneider, and R. Fehring. (2013). Efficacy of a new postpartum transition protocol for avoiding pregnancy. *Journal of the American Board of Family Medicine*. 26: 35-44.

²³ Fehring, R., and Q. Mu. (2014). Cohort Efficacy Study of Natural Family Planning among Perimenopause Age Women. *Journal of Obstetrics, Gynecology, and Neonatal Nursing*. 43(3): 351-8.

²⁴ Mu, Q., and R. Fehring. (2014). Efficacy of achieving pregnancy with fertility focused intercourse. *MCN The American Journal of Maternal Child Nursing*, 39(1): 35-40.; Bouchard, T. P., Fehring, R., and Schneider, M. (2018). Achieving Pregnancy Using Primary Care Interventions to Identify the Fertile Window. *Frontiers in Medicine*, Vol. 4; January 18: 250.

do well in helping women and couples to avoid pregnancy during the transition and in fact may increase the unintended pregnancy rate. Mucus observations can be difficult to use in estimating the fertile phases during the postpartum, as mucus is often not associated with fertility or mucus observations are unable to discern and differentiate.

In dealing with the problem of using NFP during the postpartum transition, we (Marquette researchers and others, i.e., Fehring, Schneider, and Barron 2007)²⁵ developed a protocol for using the CBEFM and creating pseudo menstrual cycles based on the 20-day testing period of the fertility monitor. Women essentially create 20-day cycles, until they have their first LH surge and then first menses. The protocol was tested successfully with ten women and then with a prospective 12-month longitudinal cohort study among 198 postpartum women aged 20 to 45 who were taught a protocol for avoiding pregnancy with either online or in-person instruction.²⁶ We found there were 8 unintended pregnancies per 100 women at 12 months postpartum. With correct use, there were 2 unintended pregnancies per 100 women at 12 months. We concluded that the online postpartum protocol may effectively assist postpartum women to avoid pregnancy during the transition to regular menstrual cycles with the MM of NFP.

We subsequently conducted a larger postpartum breastfeeding study to analyze the effectiveness of an online nurse managed natural family planning (NFP) program among breastfeeding women (and sub-groups of these women).²⁷ This study was a longitudinal comparative cohort study of breastfeeding women who as before used the Marquette University online NFP education program and menstrual cycle charting system. The participants were 816 women (mean age 30.3; SD = 4.5) who registered to use the online NFP system and indicated they were breastfeeding. We found that the correct use pregnancy rates were 3 per 100 users over 12 cycles of

²⁵ Fehring, R., Schneider, M., & Barron, M. (2005). Protocol for determining fertility while breast-feeding. *Fertility and Sterility*, 84(3), 805-807.

²⁶ Bouchard, T, M. Schneider, and R. Fehring. (2013). Efficacy of a new postpartum transition protocol for avoiding pregnancy. *Journal of the American Board of Family Medicine*. 26: 35-44.

²⁷ Fehring, R.J., M. Schneider, T. and Bouchard. (2017). Effectiveness of an Online Natural Family Planning Program for Breastfeeding women. *Journal of Obstetrics and Gynecologic and Neonatal Nursing*, 46(4): e129-137.

use and typical rates were 14 per 100 at 12 cycles of use. At 12 cycles of use, total pregnancy rates were: 16 per 100 for CBEFM users (N = 379), 81 per 100 among mucus only users (N = 45), and 14 per 100 for CBEFM plus mucus users (N = 390). We concluded that use a nurse managed online NFP program for women can be effective in helping women avoid pregnancy while breastfeeding especially with correct use and consistent use.

Finally, we realized that the postpartum protocol needed to be modified to include the first six menstrual cycles postpartum, as it is within those cycles that women become pregnant not intending to when using NFP. The reason that this is so, is because the first three cycles postpartum can be long and confusing. Our advised protocol dealt with this problem. We then tested the new protocol with for the purpose to determine the correct and typical use effectiveness rates to avoid pregnancy in women who used a revised postpartum/breastfeeding protocol.²⁸ A cohort review of an established data set from 207 postpartum breastfeeding women who used the protocol to avoid pregnancy. Total pregnancy rates that included correct and incorrect use pregnancies were 18 per 100 women over 12 cycles of use. For the pregnancies that met A priori criteria the correct use pregnancy rates were 2 per 100 over 12 months and 12 cycles of use and typical use rates were 4 per 100 women at 12 cycles of use. This revised postpartum protocol had fewer pregnancies than the original.

Perimenopause

Use of natural family planning (NFP) by perimenopausal women (i.e., those who are 40 years age and above) can be a challenge. NFP during the perimenopause is difficult because the menstrual cycle becomes more variable, and the natural signs of fertility are difficult to track. Furthermore, perimenopause is a time of a woman's and couples' life when they usually have completed their family size. There is also the greater chance of having a child with congenital abnormalities such as downs syndrome during the later reproductive ages. Although fertility of women decreases with age there

²⁸ Mary M. Schneider, Richard J. Fehring, and Thomas Paul Bouchard. (2023). Effectiveness of a Postpartum Breastfeeding Protocol for Avoiding Pregnancy. *The Linacre Quarterly*, 20: 182-193.

still is a concern with unintended pregnancies especially among women with apparent ovulatory menstrual cycles.

We conducted a study to determine the efficacy of using natural family planning (NFP) methods to avoid unintended pregnancy among women of perimenopause age (i.e., 40 – 55 years old).²⁹ We used a secondary analysis of data from two prospective observational cohort studies among 160 women who used a university based in-person and online NFP service program from to avoid pregnancy from January 2001 to November 2012. This was a prospective 12-month effectiveness study among 160 women (between the ages of 40 and 55) who used NFP to avoid pregnancy. We found the typical use pregnancy rate was 6 per 100 women over 12 months. The monitor alone participants (n=35) had a 12-month pregnancy rate of 3, the participants (n=73) who used mucus alone had a pregnancy rate of 4, and the participants (n=42) who used the fertility monitor plus mucus had a pregnancy rate of 6. We concluded that NFP methods can be effective for older women to avoid an unintended pregnancy with correct use and adequate instructions.

Achieving Pregnancy

One of the benefits of using a method of NFP is that it can also be useful in helping couples to achieve a pregnancy, especially among couples with sub-fertility. We conducted two studies that involve understanding the benefits of using NFP is focusing intercourse on the most fertile days of the menstrual cycle. Our first study involved comparing pregnancy rates when women have intercourse on self-estimated high and peak fertile days and when they only have intercourse on low fertile days during the fertile window.³⁰ We used a prospective observational cohort study design and a convenience sample of 124 women who utilized our online charting websites to achieve pregnancy from January 2010 to November 2012. The participants used the CBEFM or self-observed cervical mucus or both to determine

²⁹ Fehring, R., and Q. Mu. (2014). Cohort Efficacy Study of Natural Family Planning among Perimenopause Age Women. *Journal of Obstetrics, Gynecology, and Neonatal Nursing*. 43(3): 351-8.

³⁰ Mu, Q., and R. Fehring. (2014). Efficacy of achieving pregnancy with fertility focused intercourse. *MCN The American Journal of Maternal Child Nursing*, 39(1): 35-40.

fertility during the estimated fertile window. We found a pregnancy rate of 87 per 100 women at 12 months when intercourse happened on high or peak days and 5 per 100 when intercourse occurred only on low days of the fertile window. Chi square analysis showed a greater proportion of pregnancies with intercourse on high and peak fertile days of the menstrual cycle ($\chi^2 = 40.2, p < .001$). We concluded that focusing intercourse on high or peak fertile days during the estimated fertile window enhances the probability of achieving a desired pregnancy.

Finally, we also conducted a study among women and couples seeking to achieve pregnancy with focused intercourse during the fertile phase of the menstrual cycle.³¹ The aim of this study was to determine the effectiveness of achieving pregnancy with natural fertility indicators among women seeking to achieve pregnancy with a 12–24-month prospective effectiveness study of 256 volunteer women aged 20–43 (mean age 29.2 years) seeking to achieve pregnancy. We found there were 150 pregnancies among the 256 participants with an overall pregnancy rate of 78 per 100 women over 12 menstrual cycles. There were 54 pregnancies (68%) among the 80 women using the fertility monitor, 11 pregnancies (46%) among the 24 women using mucus monitoring, and 90 (63%) among the 143 women using both mucus and monitor. The 12-cycle pregnancy rates per 100 women were 83 (monitor group), 72 (mucus group), and 75 (mucus and monitor group). The 12-cycle pregnancy rate among those women (181) attempting pregnancy the first time was 84 over 12 months of trying versus a rate of only 55 for those 67 women who had attempted before entering this study. Pregnancy rates reached 100% at 24 cycles of use for those women using the hormonal fertility monitor. We concluded use of the hormonal fertility monitor alone seems to offer the best natural estimate of the fertile phase of the menstrual cycle for women wishing to achieve a pregnancy. Focusing intercourse through 24 menstrual cycles can be beneficial for achieving pregnancy.

³¹ Bouchard, T. P., Fehring, R., and Schneider, M. (2018). Achieving Pregnancy Using Primary Care Interventions to Identify the Fertile Window. *Frontiers in Medicine*, Vol. 4; January 18: 250.

Marquette Model NFP Teacher Training Program

Since we developed and researched the effectiveness of a new system of NFP, we also needed a NFP teacher training program for health professionals to learn how to provide the MM system of NFP. The Marquette University NFP Teacher Training program began in 1998. At first the program was only in person, for college credit, and semester long courses. In 2000 we placed the courses in an online system and eventually only offered the courses for continuing education.

The Marquette University College of Nursing Natural Family Planning teacher training program is a professional online educational experience based on the standards for diocesan NFP ministry of the United States Conference of Catholic Bishops (USCCB). As such, the Marquette Method Teacher Training Program is approved by the USCCB. The program prepares the participant to provide professional NFP services and to qualify to become a Marquette Method Certified Profession (MMCP) through certification with the Marquette Method Professionals Association (MMPA). This educational program is designed for health professionals (i.e., professional nurse (at least B.S.N. prepared), advanced practice nurses, physicians, physician assistants, and other healthcare professionals that have been approved by the Institute.

The Teacher Training program is comprised of two courses, the Core Course, and the Teacher Training Course. A third course, Medical Applications, is available for advanced practice nurses and/or medical professionals/prescribers who want to learn how to integrate NFP, specifically, the Marquette Method, into their medical practice. Medical Applications is also recommended, but not required, for audit by nurses and other non-prescribing providers in the Teacher Training Program.

Teacher Training Program

This NFP theory and application course is an online program with start dates throughout the year that is made up of four main components. All are required for the successful completion of the Teacher Training Program.

Core Course. This first course focuses on the theoretical, historical, and philosophical foundations of NFP to prepare the student to confidentially advance to the Teacher Training Course. The Core Course is four months in length.

Teacher Training Course. This course is designed to give healthcare professionals the necessary tools and procedures to develop and provide a sustainable NFP practice. Student teachers will be taught to recognize and manage behavioral and psycho-spiritual family planning issues using NFP for women and couples throughout the reproductive continuum, (i.e., from adolescence, during postpartum breastfeeding through perimenopause). The Teacher Training Course experience includes both online coursework as well as several live meetings with your cohort. The Teacher Training Course is five months in length.

Preceptor Experience. The Preceptor Experience occurs concurrently with the Teacher Training Course. Students will independently recruit and teach clients while building their own teaching materials, while under the supervision of a preceptor. Students will work directly with a qualified, experienced Marquette Method Teacher during their preceptorship. Students will be empowered to build their teaching ability, marketing skills, and critical thinking; as such, students are unable to work with a teaching group during their preceptorship to facilitate the development of these proficiencies. Students will teach 10 couples through the course of their preceptorship over the initial five months. Students will continue with their preceptors until they've achieved four six-month follow-ups from their 10 couples, at which point they will receive their certificate of completion. The four six-month follow-ups are expected to be completed within five months of course completion, a total of ten months after beginning the Teacher Training Course.

Medical Applications Course. This course will help advanced practice providers integrate NFP, specifically, the Marquette Method, into their medical practice. Through the course, students will learn to apply their knowledge of the menstrual cycle, reproductive anatomy and physiology, natural indicators of fertility, reproductive transitions (i.e., postpartum and perimenopause), and evidence-based protocols for managing common reproductive-age women's health conditions. The student will analyze, apply, and critique case studies and protocols for managing fertility-related health conditions. There is an emphasis on lifestyle changes, self-care management, and enhancement of normal fertility. The Medical Applications Course is offered asynchronously. It may be taken after completion of the Teacher Training Course.

Since 1999, we have had hundreds of health professionals complete the MM NFP teacher training program. These health professionals come from the United States, but also Canada, the UK, The Philippines, Australia, and recently Uganda. They health professionals have developed very creative MM NFP provider programs and centers for delivering the MM of NFP. Many of these programs involve group practices and online systems.

At Marquette University we continue to offer both in-person and online NFP services. One of our NFP providers (Susana Crespo, RN, BSN, CMMPA) offers NFP online and in-person and to Spanish speaking couples in the US and around the world. She also provides an NFP presentation for Spanish couples in marriage preparation through the Archdiocese of Milwaukee. We are privileged to have her as a part of our NFP team at Marquette University.

Conclusion

In conclusion, we (the faculty and staff of the Marquette University College of Nursing Institute of NFP) have been developing and modifying the MM system of NFP for the past twenty-five years. We have a consistent record of collecting research evidence for our system of NFP and will continue to do so. We have conducted numerous studies that have investigated the effectiveness or efficacy of the MM system of NFP for helping couples avoid or achieve pregnancy. In addition, we have conducted a number of studies to help understand the parameters of the menstrual cycle and the fertile window of the menstrual cycle.³² variability of the menstrual cycle after discontinuing hormonal contraception,³³ the effects of lifestyle on

³²Fehring, R., K. Raviele, and M. Schneider. (2004). A comparison of the fertile phase as determined by the Clearplan Easy Fertility Monitor and self-assessment of cervical mucus. *Contraception*, 69, 9-14.; Fehring, R., M. Schneider, and K. Raviele. (2006). Variability in the phases of the menstrual cycle. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, 35(3), 376-384. Fehring, R. J., and M. Schneider. (2008). Variability in the hormonally estimated fertile phase of the menstrual cycle. *Fertility and Sterility*, 90(4): 1232-1235.

³³Nassaralla, C. L., J. B. Stanford, K. D. Daly, M. Schneider, K. C. Schliep, and R. J. Fehring. (2011). Characteristics of the menstrual cycle after discontinuation of oral contraceptives. *Journal of Women's Health*. 20 (2): 169-177.

the phases of the menstrual cycle,³⁴ spiritual and marital dynamics in practicing NFP,³⁵ and health professional knowledge of NFP methods (Fehring 1995; Fehring, Hanson, and Stanford 2001).³⁶ Having a NFP Institute at a University and being consistent in conducting research evidence for our system of NFP helps to bring credibility for NFP in general and contributes to a culture of life.

³⁴ Lasquety, M.G., D. Rodriguez, and R. Fehring. (2012). The influence of BMI levels on phases of the menstrual cycle and presumed ovulation, *The Linacre Quarterly*, 79(4): .451-459.

³⁵ VandeVusse, L., L. Hanson, and R. Fehring. (2003). Couples' views of the effects of natural family planning. *Journal of Nursing Scholarship*, 35: 171-176.; Fehring, R., and D. Rodriguez. (2013). Spiritual care of couples using natural family planning. *The Linacre Quarterly*, 80(3): 225-238.

³⁶ Fehring, R. (1995). Physicians' and nurses' knowledge and use of natural family planning. *The Linacre Quarterly*, 62(4), 22-28.; VandeVusse, L., L. Hanson, and R. Fehring. (2003). Couples' views of the effects of natural family planning. *Journal of Nursing Scholarship*, 35: 171-176.

