

Natural Family Planning

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Natural Family Planning

Trends in Periodic Abstinence Use in the United States: 1982-1995

A recent article in *Family Planning Perspectives*¹ reports on contraceptive trends in the United States, by comparing data from the National Survey of Family Growth conducted in 1982, 1988, and 1995. The data sets included women between the ages of 14-44 of all marital status and was obtained by in person face-to-face interviews. The sample sizes were 7,969 in 1982, 8,450 in 1988 and 10,847 in 1995. All three survey years had an 80% response rate.

The most commonly reported method of contraception in the United States by women between the ages of 14-44 in 1995 was sterilization. About 27.7 percent (which represents about 10.7 million women) reported using female sterilization. The second most common method (reported by 26.9 percent of respondents) was oral contraceptives (the Pill). The biggest change in contraceptive use from 1982 to 1995 was the increase in the use of the male condom. Male condom was the third most commonly reported method by 20.4 percent of women. This is an increase from about 12 percent in 1982. The authors speculated that the increase was stimulated by fear of HIV and STDs.

The proportion of women between the ages of 14 and 44 using some form of contraception increased from 56% in 1982 to 64% in 1995. This means that 36% were not using any form of contraception. The reasons given for not practicing contraception was that 5% were sterile, 9% were currently pregnant, 11% never had intercourse, 6% did not have intercourse in the last three months and 5% had intercourse in the last three months but were not using a method.

All methods of NFP were placed in the category of periodic abstinence (PA). PA was used by 3.9 percent of women in 1982, 2.3 in 1988 and 2.3 again in 1995. The 2.3 percent represents about 883 thousand women. There were more women reporting the use of withdrawal (3.0 percent or 1.17 million) and injectable forms (3.0 percent or 1.14 million) than NFP in 1995. Furthermore, about 1% (or about 380,000) women reported the combined use of "calendar rhythm" and the condom and about 1% reported the combined use of "calendar rhythm" and withdrawal. *(I find it interesting that the old terms "calendar rhythm" for the use of natural methods was used in the report. In any case, the report indicates that NFP teachers have a lot of work to do to increase the use of NFP in the United States. RJF)*

¹ Piccinino, L.J. and Mosher, W. D. **Trends in Contraceptive Use In the United States: 1982-1995.** *Family Planning Perspectives* 30 (January/February 1998): 4-10 and 46.

Five Center Study Reveals High Effectiveness of Creighton Model System for Avoiding Pregnancy

A prospective study on the effectiveness of the Creighton Model System (rMS) to avoid pregnancy was conducted in five centers, Omaha, St. Louis, Wichita, Houston, and Milwaukee.¹ The combined results of these studies were analyzed and reported by Dr. Thomas Hilgers, Director of the Pope Paul VI Reproductive Institute, and Dr. Joseph Stanford from the Department of Family and Preventive Medicine at the University of Utah, Salt Lake City. The five studies represent a total of 1,876 couples and 17,130.0 couple months of use. The results were analyzed using life table analysis. The method effectiveness (or perfect use) of the CrMS was 99.5 at the 12th ordinal month and 99.5 at the 18th ordinal month. The use effectiveness results (or typical use) were 96.8 and 96.4 at the 12th and 18th ordinal months. Discontinuation rates were 11.3% at the 12th ordinal month and 12.1% at the 18th ordinal month.

The method effectiveness ratings in the five Creighton Model centers were very stable and effective over time. Use-effectiveness rates on the other hand increased over time. The first use-effectiveness study conducted in Omaha in 1980 was 94.6% at the 12th ordinal month and the last study in Milwaukee reported in 1995 was 97.9%. The authors attributed the increased use-effectiveness due to improved teaching materials, refined teaching techniques and better NFP teacher training. *(A criticism of the study was that the couples in the study over the five centers, were rather similar, i.e., most were Catholic, white, and had at least a high school education. The Creighton system merits continued development and further study of its effectiveness in more diverse populations and with specific reproductive categories. There is also some criticism with regard to how Hilgers and Stanford conceptualize "effectiveness." See, The Journal of Reproductive Medicine 44 (1999) which carries letters from James Trussell and John Kippley as well as a response to them from Hilgers and Stanford. The exchange is very informative and recommended. RJF)*

¹ Hilgers, T. and Stanford, J. **Creighton model naproeducation technology for avoiding pregnancy - use effectiveness.** *The Journal of Reproductive Medicine* 43 (1998): 495-502.

Study Shows that Sex of Baby is Not Associated with Time of Intercourse, Length of Follicular Phase or Planning Status, among Users of Natural Family Planning

In order to determine if sex ratio was related to the timing of intercourse in relation to the day of ovulation, the estimated length of the follicular phase of the conception cycle, or by the

planned or unplanned status of the pregnancies, researchers at Johns Hopkins, Georgetown and Baylor University conducted a prospective study of all women who became pregnant from 1987 to 1994 while using NFP as taught in five centers located in Chile, Colombia, Italy and the United States.¹ There were 947 singleton births during that time period, of which 477 were boys and 470 were girls. This yielded a sex ratio of 101.5 males per 100 females, which was not significantly different from the expected ratio of 105 males to 100 females as found in previous studies. The researchers also observed no association between the timing of intercourse and the sex ratio or evidence to show that intercourse around the time of ovulation results in a predominance of females. Nor did they find any consistent association between follicular phase length or planning status of the pregnancy and the sex ratio. Their findings both confirm and contradict findings from previous studies, most noticeably, the recent studies by Wilcox, Weinberg and Baird which involved a prospective study of 221 women who were planning a pregnancy and recorded daily urine samples for LH surge detection and diaries of the time of intercourse.^{2 3} As in the Gray et al study, the Wilcox, Weinberg, and Baird group did not find a sex ratio difference in association with the timing of intercourse but did find an excess of males in cycles with shorter follicular phases. Gray et al stated the differences might be due (but not probably) to the imprecision in the estimation of the day of ovulation through the mucus peak or shift in basal body temperature, the self-reporting of the actual day of intercourse, and the determination of which act of intercourse resulted in conception. They concluded that manipulating the time of intercourse in relation to the estimated day of ovulation or the length of the follicular phase cannot be used to preselect the sex of the baby. No recommendations for future research in this area was provided. (*I wonder if the quality and/or quantity of the externally observed cervical mucus in relation to the estimated day of ovulation would have any association with the sex of the offspring. In other words, does the quality of the cervical mucus have any influence on the filtering or facilitation of the x, female, or y, male, sperm. RF*)

1. Gray, R., Simpson, J., and Bitto, A., et al. **Sex ratio associated with timing of insemination and length of the follicular phase in planned and unplanned pregnancies during use of natural family planning.** *Human Reproduction* 13 (1998): 1397-1400.
2. Weinberg, C., Baird, D., and Wilcox, A. **The sex of the baby may be related to the length of the follicular phase in the conception cycle.** *Human Reproduction* 10 (1995): 304-307.
3. Wilcox, A., Weinberg, C., and Baird, D. **Timing of sexual intercourse in relation to ovulation. Effects on probability of conception, survival of the pregnancy, and sex of the baby.** *New England Journal of Medicine* 333 (1995): 1517-1521.

Breastfeeding

More Good News about Breast-feeding: Increased Use in USA; Lower Number of Ear Infections; Better Academic Outcomes

Ross Laboratories has been conducting large national surveys on breast-feeding since 1955 to determine patterns of milk feeding from birth to 6 months of life.¹ In 1989, 196,000 questionnaires on infant milk feeding practices were mailed and in 1995, 720,000 questionnaires were mailed to a representative sample of first time mothers with infants who were 6 months old. The 1995 sample represented about 80-85% of all new mothers in the United States. The survey routinely receives a 50% + 5 response rate. The 1995 survey results demonstrated an increase from 1989 to 1995 in initiating breast-feeding and in the continuation of breast-feeding at 6 months of age in first time mothers. The initiation of breast-feeding increased 14% from 1989 to 1995 and the continuation of breast-feeding at 6 months of age increased 19.3% from 1989 to 1995. The greatest increases were found among the young, poor and less educated. This group however continues to be the mothers who traditionally have been the least likely to practice breast-feeding. The author recommended to continue educational efforts to extol positive attitudes about breast feeding among this vulnerable group of women and infants.

Researchers from the School of Medicine at the State University of New York have followed a group of 306 infants at well-baby visits from shortly after birth through 24 months of age in order to determine the relation of exclusive breast-feeding to episodes of acute otitis media (i.e., ear infections).² They collected detailed prospective information about the exclusiveness of breast-feeding, parental smoking, and day care attendance at scheduled well-baby clinic visits. They also conducted tympanometric, otoscopic examinations and nasopharyngeal cultures at 1-6 months and at 8, 10, 12, 15, 18, and 24 months of age to detect ear infections. The researchers categorized feeding groups into exclusively breast-feeding, combined breast- and formula-fed and exclusive formula-fed. The results showed that at 3 months of age the incidence of otitis media (OM) was less than 20% for all groups but by 6 months of age the incidence of OM was greater than 50% for formula-fed from birth but remained less than 30% for infants exclusively breast-fed. Between 6- 12 months of age the cumulative incidence of OM episodes increased from 25% to 51% in infants exclusively breast-fed and from 54% to 76% in infants formula-fed from birth. The researchers determined that formula-feeding was the most significant predictor of OM followed by day care outside of the home. Breast-feeding even for short durations (3 months) reduced the onset of OM episodes in infancy. The cohort of infants for this study, however, were 99% Caucasian and from suburban mothers who had an average education of 14+ 2 years. The incidence of exclusive breast-feeding at 6 months was only 16%.

Researchers from the Christchurch School of Medicine in New Zealand followed a cohort of greater than 1,000 New Zealand children from birth through 8 to 18 years in order to determine the association between duration of breast-feeding and childhood cognitive ability and academic achievement.³ From birth through one year of age the researchers collected information on maternal breast-feeding practices and from 8 to 18 years of age, sample participants were assessed on a range of cognitive and academic outcomes. Results showed that duration of breast-feeding was associated with significant increases in intelligence quotients, reading comprehension, mathematical ability, teacher rating of school performance, and higher pass rates in school leaving examinations. Children who were breast-fed for greater than 8 months had mean test scores that were between 0.11 and 0.30 standard deviation units higher than those not breast-fed. The researchers concluded that breast-feeding is associated with small but detectable increases in child cognitive ability and educational achievement.

1. Ryan, R. S. **The resurgence of breastfeeding in the United States.** *Pediatrics* 99 (1997): e12.
2. Duffy, L. C., Faden, H., and Wasielewski, R., et al. **Exclusive breastfeeding protects against bacterial colonization and day care exposure to otitis media.** *Pediatrics* 100 (1997): e7
3. Horwood, L. J., and Fergusson D. M. **Breastfeeding and later cognitive and academic outcomes.** *Pediatrics* 101(1998): e9.

[Contraception](#)

Side Effects Continue to Plague Users of Oral Contraceptives

Three recent studies illustrate that side effects experienced by users of oral contraceptives are significant enough to contribute to non-compliance, unintended pregnancy and discontinuation rates.^{1 2 3} The first study was a nationwide prospective study of 1,657 women who either were initiating the use of oral contraceptives or switching to a new brand. These women participants, who were obtained from private practices, clinics and health maintenance organizations were studied by researchers from the University of North Carolina to determine the frequency and reasons for oral contraceptive discontinuation. They found that after a six month period 32% of the new users and 16% of the "switchers" discontinued the use of oral contraception. The most frequent reason given for stopping the use of oral contraceptive was side effects (46%) followed by not having continuing need (23%), either they become pregnant or ended their sexual relationship. The most frequent side effects were as follows: bleeding irregularities (12%), nausea (7%), weight gain (5%) and mood changes (5%). What is significant

is that 9% of the women's clinicians recommended discontinuation of oral contraceptives due to side effects.

Another study conducted by the same researchers from the University of North Carolina-Chapel Hill, the senior project director of Health Decisions and the medical director of Planned Parenthood Federation of America found that 31% of a nation wide sample of 943 women experienced side effects of oral contraceptives serious enough to either call or visit their health provider. Of the women who called their provider, the most frequent reported side effects were breast tenderness, mood changes, nausea and inter-menstrual spotting. The most frequent side effects of the women who made visits were weight changes, mood changes, breast tenderness and nausea. Sixty percent of the callers and 75% of the women who made visits experienced four or more side effects. The researchers also reported that the costs associated with the calls or visits were substantial. The "callers" spent on an average \$256 and the "visitors" spent \$62 on an average over a two-month follow-up period to treat the side effects.

An unrelated study was conducted by family practice physicians at Madigan Army Medical Center to determine the prevalence and factors associated with unintended pregnancy in female soldiers.³ From mid-February 1996 through mid-February 1997, all soldiers (n = 347) presenting for pre-natal care were administered a 12-page written questionnaire. Of the 347 soldiers, 55% reported that their pregnancies were unintended at the time of pregnancy and the majority (62%) of these soldiers were not using any form of contraception. The most common reason given for not using contraception was the experience or fear of side effects. The most common side effects were nausea, weight gain, headaches, and irregular bleeding. Of interest is that 72 of the women who were using some form of family planning to avoid pregnancy and had an unintended pregnancy, 37 were using male condom, 27 were using oral contraception, and 7 were using some form of periodic abstinence.

1. Rosenberg, M. J., and Waugh, M. S. **Oral contraceptive discontinuation: A prospective evaluation of frequency and reasons.** *American Journal of Obstetrics and Gynecology* 179 (September, 1998): 577-582.
2. Rosenberg, M. J., Waugh, M. S., and Burnhill, M. S. **Compliance, counseling and satisfaction with oral contraceptives: A prospective evaluation.** *Family Planning Perspectives* 30 (March/April, 1998): 89-92, and 104.
3. Clark, J. B., Miser, F., and Holt, V. L. **Unintended pregnancy among female soldiers presenting for prenatal care at Madigan Army Medical Center.** *Military Medicine.* 163 (July, 1998): 44-448.

Retrospective Contraceptive Effectiveness Studies Reported in Literature

Three research groups recently reported on the contraceptive effectiveness of various methods of family planning. The first group, from the University of Dusseldorf Germany, investigated the effectiveness of an electronic fertility monitor called the Babycomp/Ladycomp (BC/LC). They obtained subjects for their study from German and Swiss purchasers of the BC/LC from a three years period prior to the study.¹ The second retrospective study was from a research group headed by a statistician from the United Nations Population branch.² This group used public access data from the National Survey of Family Growth (NSFG) and determined the failure rates of a variety of methods of contraception, including periodic continence. The third group, from the Office of Population Research at Princeton University also used data from the NSFG.³ The Princeton group retrospectively determined both failure and discontinuation rates of contraception methods.

The Babycomp/Landycomp (LC/BC) is a fertility monitor that electronically records basal body temperature and calender rhythm and identifies for the user the infertile and fertile days of the menstrual cycle. The Babycomp version of the monitor is targeted for women who are trying to conceive and the Ladycomp for those women who are trying to avoid a pregnancy. The monitor does not give a readout of temperature but rather a green, red or yellow light. The green light means infertility, the red light fertility and a yellow light that indicates unsure or probable fertility. The LC/BC is similar to two other electronic fertility monitors now on the market, i.e., the Bioself 2000 and the Cyclotest. Data from these monitors can be interfaced with a personal computer and displayed as fertility charts.

The German researchers from the Women's Clinic (Frauenklinik) at the University of Dusseldorf were able to obtain the names of 648 women from Germany and Switzerland who purchased and used the LC/BC. These women were sent questionnaires on how they were using the electronic devices, whether they were using them to achieve or avoid pregnancy and whether the light on the day they had intercourse was green, red or yellow. Of these 648 women, 597 used the device for contraceptive purposes (i.e., to avoid pregnancy) over a grand total of 10,275 months. Thirty three of these women became pregnant that did not intend to. Using life-table analysis, the researchers determined that there was a 5.3% unintended pregnancy rate after one year, 6.8% after two years of use and 8.3% after 3 years. The average length of the fertile period that the monitor identified was 14.3 days. Ninety percent of the LC/BC users would recommend the monitor for their friends. Twenty-one of the 33 users with an unintended pregnancy also would do so.

Since 1955 the United States Government has been periodically conducting studies on family life. Included in these studies are questions on the use of family planning methods. The studies are now called the National Survey of Family Growth (NSFG) and are administered

through the Center for Health Statistics. In 1995, a nationally representative sample of 10,847 women between the ages of 15-44 were given an in-depth face-to-face interview about marriage and family life. These women were also asked to recall on a month to month basis from January of 1991 what method of contraception that they were using and whether they became pregnant that month. This data is available from the Center for Health Statistics to use for research and policy purposes.

Population researchers from the United Nations and Princeton University used this data to calculate and report on what they call contraceptive failure rates on a variety of methods of contraception. The Princeton group also reported on discontinuation rates. Included in these methods of "contraception" are what they call periodic abstinence. Periodic abstinence refers to use of calendar/rhythm, basal body temperature, the cervical mucus method and what is generically referred to as natural family planning. Eighty-six percent of the periodic abstinence in the UN study was through the use of calendar rhythm. In the Princeton study there were only 250 intervals of use of periodic abstinence and only 33 of those were with natural family planning. The UN study factored in under-reporting of abortions to calculate failure rates, the Princeton study did not. Both studies used some form of life-table analysis. The results from the two studies are as follows:

Percentage of women experiencing contraceptive failure and discontinuing contraceptive use by method and duration (12 months) of use (NSFG Data, UN and Princeton Studies)

Method	UN/Failure*	Princeton/Failure	Princeton/Discontinuation
Implant	1.3	2.3	15.7
Injectable	2.5	3.2	44.4
IUD	ND**	3.7	36.4
Pill	7.3	6.9	32.0
Diaphragm	14.4	8.1	42.8
Male Condom	13.8	8.7	47.3
Spermicide	27.0	15.3	58.2
Sponge	ND**	18.4	63.7
Withdrawal	24.1	18.8	57.1
Periodic Abstinence	24.3	19.8	48.8

Failure* = The UN failure rates factored in the under reporting of abortions.

ND** = no data provided

Both the UN and the Princeton studies found that the higher failure rates coincide with contraceptive methods that require day to day conscious efforts by the user. They also found higher failure rates with low-income and Hispanic women. The UN study found higher failure rates among co-habiting women, unmarried women and adolescents.

(The authors of all three of the above cited studies point out that retrospective studies, where women respondents are asked to recall use of a contraceptive method, the timing of conception and intention, have many disadvantages and cannot be compared with prospective studies. I would also point out that the UN and Princeton studies had very few respondents who were using modern methods of natural family planning. I also would question whether those who listed calender/rhythm were actually following the formulas and guidelines of that method. James Trussell pointed out in the Princeton study that women often over report the use of contraception--to indicate that they were responsible and not at fault when they got pregnant. I have had women tell me that they have gotten pregnant using Rhythm. When I ask them what they meant, by their response--"I counted 14 days"-- indicates no knowledge of the formal rules of Rhythm. In other words I suspect that women respondents in the NSFG over reported the use of Rhythm and did not use the formal method.

It is also interesting that the unintended pregnancy rate, i.e., failure rate, of the German/Swiss women who used the LC/BC was only 5.3% as compared to 19-24% with the NSFG women. Some of the difference could be accounted for by income and educational levels, marital status and commitment. However, as the authors of the Dusseldorf study point out, the German/Swiss women learned to use the LC/BC by reading the manufacturers instructions and so might not pay as much attention to abstinence or adjust to stages of the cycle. They concluded that the LC/BC and like electronic monitors could produce reasonable results with users who like this type of technology. I agree. This new technology can be a reasonable choice for women and couples who do not want to use artificial means to avoid pregnancy. RJF)

1. Fruendl, G., Frank-Hermann, P., and Godehardt, E., et al. **Retrospective clinical trial of contraceptive effectiveness of the electronic fertility indicator Ladycomp/Babycomp.** *Advances in Contraception* 14 (1998):97-108.
2. Fu, H., Darroch, J. E., and Haas, T, et al. **Contraceptive failure rates: new estimates from the 1995 National Survey of Family Growth.** *Family Planning Perspectives* 31 (March/April, 1999): 56-63.

3. Trussell, J. and Vaughan, B. **Contraceptive failure, method-related discontinuation and resumption of use: results from the 1995 National Survey of Family Growth.** *Family Planning Perspectives* 31 (March/April, 1999): 64-72, 93.

Contraceptive Use among Roman Catholic Women Reflects National Trends

Richard J. Fehring, DNSc, RN with Andrea Schlidt, RN, BSN (graduate research assistant at Marquette University)

According to data from the 1995 National Survey of Family Growth (NSFG), 3,130 out of the 10,847 respondents or about 29% listed themselves as Roman Catholic. Of the 3,130 Catholic women respondents between the ages of 14 and 44, 34% were not using any method of family planning either because they were pregnant, early post-partum, not sexually active, sexually active and not using a method or had been sterilized for medical reasons. Therefore, 66% of the Catholic respondents were using some form of family planning. This percentage of women responders is slightly higher than the percent (64%) of the total group of respondents who were using some method of family planning.¹ Of the 64% of Roman Catholic women who reported using some form of family planning only 3.7% reported using a natural method, i.e., calendar rhythm, basal body temperature (BBT) or NFP in the last month prior to the date of interview. Of these, only 13 women, or 0.6% of the total, were using a modern method of NFP.

The most frequent methods of family planning reported by Catholic women were female sterilization (27.4%), the Pill (26%), and the male condom (23.8%). This is the same order of frequency reported by all women respondents. The percentages in the total group of female respondents was (27.7%) for female sterilization and (26.9%) for the Pill. The total group had a slightly less frequent use of the male condom (20.4%). The Catholic women also had a less frequent report of male sterilization (6.4%) as compared to the total group of respondents (10.9%). Of interest is that Catholic women reported more frequent use of withdrawal (4.0%) as their primary method of contraception than the use of any form of a natural method. (See table one for the raw frequency of methods of family planning among the Catholic women respondents.)

Table One: 1995 National Survey of Family Growth Respondents File: Breakdown of birth control methods used in the last month prior to interview for Roman Catholic respondents (N = 3,130)

Method of Birth Control Used in the Last Month	Number of Catholic Respondents
Blank, Inapplicable	316
Pill	536
Male Condom	490
Female Condom	0
Foam	6
Jelly (Without Diaphragm	6
Suppository or Insert	13
Diaphragm	37
Norplant	34
Depo-Provera	54
IUD	19
Female Sterilization	564
Vasectomy	132
NFP, Temperature Rhythm	13
Calendar Rhythm	64
Withdrawal	83
Today Sponge	2
Morning-After Pill	0
Cervical Cap	0
Partner Sterile	73

Other Method	5
No Method, None	683

¹ Piccinino, L. J. and Mosher, W. D. **Trends in Contraceptive Use In the United States: 1982-1995.** *Family Planning Perspectives* 30 (January/February 1998): 4-10 and 46.

Under the Microscope

Accuracy of Miniature Microscope Fertility Monitors in Question

Over the past ten years, a number of small hand-held microscopes have been developed and marketed for the purpose of helping women determine the fertile and infertile times of their menstrual cycles. These small microscopes are designed for self-observation of ferning patterns in either saliva or cervical-vaginal mucus. Three of these "fertility tester" microscopes (the PG-23, the F-Tester, and the PFT-1-2-3) have two flexible plastic pieces that are connected together. On one side is the lens of the microscope and on the other half is a plastic slide where the user smears saliva or cervical-vaginal mucus. After drying the mucus or saliva for 5-20 minutes, the user looks through the lens (in front of a light source) for a defined ferning pattern. Three other hand-held microscopes, the PC-2000, the Ovu-tec, and the Lady Free Biotester, have their own built-in light source (See Figure 1). These microscopes are small enough to be placed in a purse and to be used in the privacy of an office, bathroom or home. The devices range in price from \$39 to \$75, are reusable and have a magnification of about 50-100X. Theoretically, the crystallization pattern of the mucus and saliva coincides with the female fertile period. The crystallization is due to NaCl that cyclically increases under the influence of estrogen.

Three studies have been published that have evaluated two of these miniature microscope fertility monitors.^{1 2 3} In 1993, Barbato, Pandolfi, and Guida reported a study in which they had 32 women participants use the PG/53 pocket microscope (see figure two).¹ Of the 32 women-cycles, 28 had interpretable salivary ferning patterns during the same period as other markers of fertility, i.e., basal body temperature rise and changes in the appearance of cervical mucus. Ferning lasted a mean of 6.2 days and began 1-2 days before the cervical mucus appearance and were an average of 7.2 days before the first day of the temperature shift. Guida, Barbato, and others also reported a study in which 10 women underwent serial ultrasound to determine the probable day of ovulation by the observation of follicular collapse.² Of the 10 women, 6 had maximum ferning the day of ovulation and 4 had maximum ferning 2 days before or after ovulation. These authors recommended that the PG/53 could be used in combination with other

markers of fertility (e.g., BBT, cervical mucus) and that further research be conducted to improve the use of salivary ferning for family planning.

This author recently published 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 (see figure three).³ 12 seasoned Creighton Model NFP teachers (with an average age of 36.7 years and who have used NFP for an average of 12 years) observed their cervical mucus on a daily basis, tested their urine for LH with the OvuQuick ovulation detection kits, and observed salivary and cervical mucus ferning patterns (with the Lady Free Biotester) for two menstrual cycles. The results showed that 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. The authors were able to observe ferning patterns throughout some of the cycles. Furthermore, the first author (a male) was able to detect beautiful-USA Conference in Denver, Dr. Erik Odeblad commented on use of salivary ferning by stating that in order for this to theoretically work the oral cavity would need to have estrogen receptors to stimulate the changes. Since the oral cavity is not a usual site for estrogen receptors, the monitoring of estrogen stimulated ferning patterns with the use of miniature microscopes is not plausible. This author would not recommend the use of the miniature microscope to monitor ferning patterns in saliva as a marker of fertility. The miniature microscope might have some use in differentiating cervical-vaginal mucus patterns, especially with women who have continuous mucus. However, further research needs to be conducted to evaluate the use of these microscope fertility monitors.

1. Guida, M., Barbato, M., and Bruno, P., et al. **Salivary ferning and the menstrual cycle in women.** *Clinical Experiments in Obstetrics and Gynecology* 20 (1993): 48-54.
2. Barbato, M., Pandolfi, A., and Guida, M. **A new diagnostic aid for natural family planning.** *Advances In Contraception* 9 (1993): 335-340.
3. Fehring, R., and Gaska N. **Evaluation of the Lady Free Biotester in determining the fertile period.** *Contraception* 57 (1998): 325-328.