

*Periodic abstinence  
for family planning*

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# *Periodic Abstinence for Family Planning*

*Edited for the IPPF International Medical Advisory Panel  
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1983

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# *Preface*

In every edition of our major medical handbook, the IPPF *Family Planning Handbook for Doctors*, we have had a chapter discussing the various ways of using periodic abstinence as a form of contraception. These include the following methods: calendar, basal body temperature, cervical mucus and sympto-thermal. Several of these methods are now being used by many couples throughout the world with varying degrees of success, and some are being promoted quite vigorously. Because of this renewed interest in this type of contraception, we considered that a separate publication on the subject was needed; hence this booklet. We hope that it will help those doctors and other health workers who have to advise men and women on these methods.

The term 'natural family planning' will not be found in this booklet. It is not considered that these methods are entirely natural, as they require abstinence from sexual intercourse for varying times during the menstrual cycle, sometimes for more than half the cycle days. Some couples possess the extremely high degree of motivation needed, but for many the discipline is too difficult to sustain continuously, and this is reflected in failure rates of 20-25% found in use-effectiveness studies.

For this reason, the IPPF International Medical Advisory Panel (whose statement on periodic abstinence\* can be found as an appendix to this booklet) does not consider periodic abstinence an equal alternative to other more effective family planning methods. However, as the Panel pointed out, there are a number of benefits to be gained from an understanding of the techniques of identifying the fertile phase. In particular, some couples find these methods useful for planning a wanted pregnancy, in that they can utilize the days around the time of ovulation to try to conceive. This positive side of the various methods is brought out in the text. Other couples may choose to use barrier methods only during those days estimated to be the fertile phase of the woman's cycle.

As usual with IPPF medical publications, the text of this booklet was seen by experts in many parts of the world. Our thanks go to all those who have given their time to advise us on the contents.

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\*Approved as IPPF Policy by the IPPF Central Council in November 1982.

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## *Historical review*

Abstinence from sexual intercourse during part of the menstrual cycle has been practised throughout history because of religious observance or taboo, or in a haphazard attempt to avoid conception. Periodic abstinence to avoid conception based on scientific criteria began only in 1929 when Knaus in Austria observed that ovulation has a fixed relationship to the following menstrual period, occurring approximately 14 days before its onset.<sup>25</sup> In 1930 Ogino made a similar observation independently in Japan.<sup>43</sup> Before that time knowledge of which part of the menstrual cycle was fertile and which infertile was vague and often incorrect. From Hippocrates to the early 20th century menstruation was commonly associated with ovulation and the most fertile part of the cycle was assumed to be that which immediately followed menstruation.<sup>41</sup> Even during the past 20 years, surveys have shown that fewer than half the people interviewed had accurate knowledge of the fertile and infertile phases of the cycle.<sup>48, 70, 71</sup>

**Misinterpretations of the menstrual cycle**

The history of periodic abstinence and the Catholic Church is an interesting one. St Augustine explicitly condemned it as an unacceptable practice for a Christian.<sup>41</sup> In the 19th century the Holy Office of the Vatican permitted Catholic couples to use periodic abstinence. Paradoxically, the method approved recommended sexual intercourse in the middle of the cycle and abstinence after menstruation (see above). The Papal encyclicals *Casti Conubii* and *Humanae Vitae* both approved periodic abstinence, and the Second Vatican Council (1962) set the loving aspect of marriage and human sexuality on a level with the procreative aspect. Some contemporary moral theologians feel that periodic abstinence is morally different from other forms of contraception, while others do not believe such a distinction tenable or necessary.

**Catholic views**

## The basal body temperature

Temperature rise after ovulation

Although the scientific era of the practice of periodic abstinence began in 1929, the preceding century had seen a number of relevant scientific discoveries. In 1868 Squire reported a fall in body temperature at the time of menstruation, with a rise sometime beforehand.<sup>61</sup> Recognition of the significance of this rise had to wait until 1928, when Van de Velde linked it to the activity of the corpus luteum, and hence to ovulation.<sup>65</sup> A number of workers then demonstrated a relationship between the rise of the basal body temperature and a variety of indices of ovulation such as changes in vaginal smears, the presence of a secretory endometrium, and evidence at operation or laparoscopy of recent release of an ovum from the ovary. Hartman,<sup>15</sup> in his classical work *Science and the Safe Period*, reviewed the evidence for correlation between not less than 11 indices of ovulation and the rise in basal body temperature. The suggestion that this rise could be used to time sexual intercourse so as to avoid conception was first made by Ferin in 1947.<sup>9</sup> The practical details of this application were worked out by Holt<sup>17</sup> and Marshall,<sup>27,29</sup> among others.

## Cervical mucus

Changes in cervical mucus during cycle

Observations of cyclical changes in cervical mucus, the other much used indicator of ovulation, were first made in the mid-19th century by Pouchet<sup>50</sup> and Smith.<sup>59</sup> Some two decades later Sims,<sup>58</sup> who invented the vaginal speculum which bears his name, reported that cervical mucus, depending on its state, could either block or promote migration of sperm. Again, however, there was a long interval before the contraceptive significance of these observations was appreciated. In 1933 Seguy and Simonet<sup>55</sup> related changes in cervical mucus to the rise in urinary oestrogen which precedes ovulation. The practical development, as a contraceptive method, of timing sexual intercourse in relation to changes in cervical mucus, was mainly the work of John and Evelyn Billings.<sup>3</sup>

## Practical developments

The application of these scientific observations to family planning behaviour has proceeded in three phases. Initially, using the data provided by Ogino and Knaus, calculations were made to try to decide when ovulation was likely to occur during the next menstrual cycle. This meant having a record of past menstrual cycles, usually kept by

marking a calendar, hence the term 'the calendar method'. As the method depends on predicting events in the next menstrual cycle on the basis of experience of past cycles, it can never be free from error, although for some women with regular cycles it offers a degree of protection.<sup>63</sup> For those with irregular cycles, the long periods of abstinence required and the low degree of reliability provide little recommendation for this method. It has now been dropped from most programmes, although many couples still depend on it.

**Calendar  
method**

The introduction of the basal body temperature (BBT) method constituted the second phase, and was a major advance. Irregular cycles are no longer a problem as far as recognition of the time of ovulation is concerned, for the event is marked by a rise in BBT in each cycle. Sexual intercourse after ovulation can therefore take place with a high degree of confidence that conception will not occur. However, BBT provides no information about the approach of ovulation; hence it is no guide to the timing of sexual intercourse in the early part of the cycle before ovulation. In anovulatory cycles there is no shift in temperature (monophasic chart) and abstinence has to be practised continually if the BBT is the only criterion taken into account (see page 20).

**BBT useful  
only after  
ovulation**

The third phase of development was the introduction of observations on cervical mucus. This method offered two improvements. What came to be known as 'peak mucus' or the 'peak symptom' was shown to be a marker of imminent ovulation.<sup>3</sup> The changes in mucus before the peak symptom give warning that ovulation is pending and so provide guidance about the timing of sexual intercourse in the early part of the cycle. Some instructors advocate the use of mucus alone in what has been termed the 'cervical mucus method' or, in the version taught by Billings, 'the ovulation method'. The term 'ovulation method' is misleading and is better avoided. It implies that ovulation itself rather than a phenomenon associated with it is being observed. 'Cervical mucus method' is a more accurate description and will be used here.

**Mucus gives  
information  
throughout  
cycle**

Other instructors combine observations on cervical mucus (and other symptoms in some cases) with recordings of BBT in what is generally known as the sympto-thermal method. The term 'rhythm' which was originally coined in relation to the calendar method has been used in so many senses as to have lost much of its meaning, and for this reason should be discarded.

These developments do not constitute the end of an era. Other indicators of the approach of ovulation and its occurrence besides BBT and cervical mucus are the subject of active research.

Foremost among these are changes in hormonal levels. Already these are measured in the laboratory; the task now is to develop

**'Dip-stick'  
hormone  
measure-  
ment**

methods of measurement which can be applied by a woman in a domestic setting. Methods of measuring urinary hormonal levels similar to the dip-stick used by diabetic patients to estimate the level of sugar in the urine should be feasible and would constitute a major advance.

Attempts are being made to measure several substances in the saliva to detect ovulation, but so far these have not been successful on any widespread scale.<sup>47</sup>

**Cervical  
mucus  
enzymes**

It would be useful to be able to measure in a simple manner changes in the levels of some enzymes in cervical mucus. These are amino-peptidase, esterase, alkaline phosphatase and lactase dehydrogenase, all of which drop at mid-cycle and rise again after ovulation.<sup>38,39</sup>

The ultimate goal of research in this field is to find a simple test that can be self-administered and will consistently and accurately predict and detect ovulation.

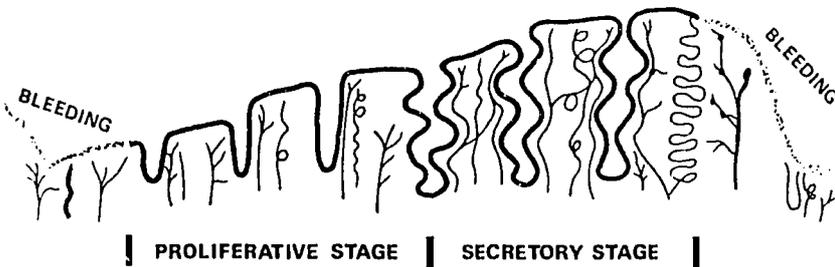
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## *Physiology of the menstrual cycle*

The main features of the menstrual cycle are well known and require only a brief mention.

### **The endometrial cycle**

The onset of menstruation is so readily recognizable an event that the custom has developed of marking it as the first day of a new cycle. However, in biological terms it marks the end of a cycle, with the shedding of the endometrium which had been prepared to receive the fertilized ovum. During the days following menstruation the endometrium regenerates in what is known as the proliferative phase. This phase ends at ovulation and is followed by the secretory phase. This terminates with the onset of the next menstruation, thus completing the cycle (Fig. 1).



**Fig. 1.** *Endometrial changes during the menstrual cycle.*

### **The ovarian cycle**

Corresponding changes occur in the ovary. In the days following menstruation a number of follicles ripen in the ovary (follicular phase), one of which eventually ruptures and releases an ovum, while

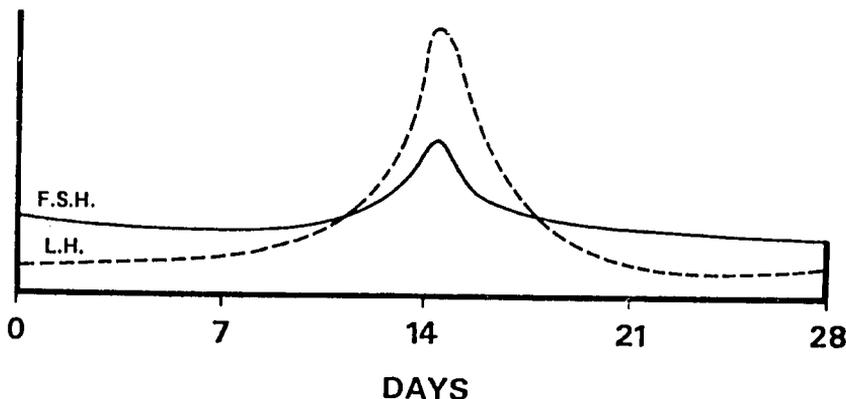
the remainder regress (luteal phase). Following ovulation a corpus luteum forms at the site of the ruptured follicle. If the ovum is not fertilized the corpus luteum begins to degenerate after an interval of 12-16 days, which acts as a stimulus to the process leading to menstruation.

## Hormonal changes

Cyclical changes in the ovaries, uterus and elsewhere in the body are under the influence of hormones. These are produced at two levels, the ovary and the pituitary, the latter being controlled by the hypothalamus. It is via the hypothalamus that emotional and environmental factors which can affect the menstrual cycle exercise their influence. The hypothalamus produces gonadotrophin-releasing hormone which passes down the portal vessels to reach the cells of the anterior pituitary, causing the release of the two gonadotrophins, follicle-stimulating hormone (FSH) and luteinizing hormone (LH).

During the early part of the menstrual cycle the level of circulating FSH is elevated. This causes a number of follicles in the ovary to ripen and stimulates the production of the first ovarian hormone, oestrogen. Just before ovulation there is a sudden small peak in the level of FSH, but this is overshadowed by the much larger peak in the level of LH, which is an important trigger of ovulation (Fig. 2). This

Hormonal  
control  
of the  
menstrual  
cycle



**Fig. 2.** *Gonadotrophin levels in blood and urine during one menstrual cycle.*

surge of LH secures the formation of the corpus luteum following ovulation. The corpus luteum secretes the second ovarian hormone, progesterone.

Oestrogen is secreted in increasing amounts in the first part of the

cycle, reaching a peak before ovulation. It continues to be produced after ovulation, though in much smaller amounts. It has many effects, the most important for the present purpose being:

(1) it secures the regeneration of the endometrium in the proliferative phase;

(2) it causes the cervical mucus to undergo physico-chemical change making it more favourable to the migration of sperm;

(3) it makes the cervix softer and opens the os; and

(4) by a feed-back mechanism on the pituitary, it inhibits the further secretion of FSH.

**Oestrogenic effects**

Progesterone is present only at low levels before ovulation, at which time the level rises to reach a peak after three or four days. In the days up to the onset of the next menstruation the level then slowly falls if fertilization of the ovum does not take place. Progesterone also has many effects, the relevant ones being:

(1) it produces the secretory changes in the endometrium;

(2) it causes the cervical mucus to change to a thick, viscid substance which is difficult for sperm to penetrate;

(3) it causes a rise in the basal body temperature;

(4) it aids the implantation of the fertilized ovum and promotes the early stages of its development;

(5) it exercises a negative feed-back influence on the anterior pituitary, similar to that of oestrogen; and

(6) it suppresses the ripening of further ova.

**Progesterone effects**

It is clear that the whole cyclical process leading to ovulation is firmly under the control of the hormones oestrogen and progesterone. These hormones affect other physiological indicators such as the BBT and cervical mucus, which makes it possible to use them to estimate the time of ovulation.

## The life of the ovum and sperm

Information about the time of ovulation, however precise, would be of no value if the ovum after ovulation or sperm after sexual intercourse were to survive indefinitely. Fortunately this is not the case. Information obtained from the results of artificial insemination and from cycles in which the time of ovulation and of sexual intercourse were precisely known indicates that the ovum can only be fertilized during 12 to at most 24 hours after its release from the ovary.<sup>13</sup>

**Ovum viable for 12-24 hours**

Information about the life of human sperm is less satisfactory. This is because motility does not necessarily equate with the capacity to fertilize, and because environment has a marked influence upon survival. Sperm which remain in the highly acid vagina do not survive

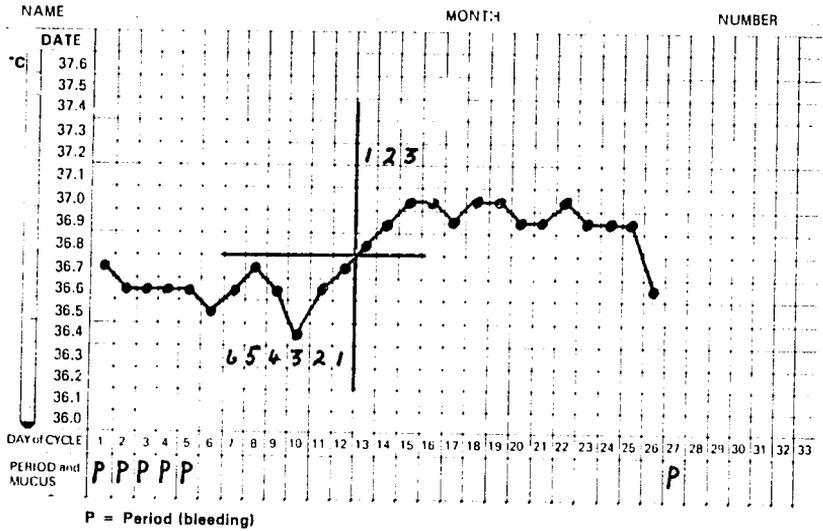
for more than a few hours. Those which reach cervical mucus which has undergone the changes which precede ovulation survive much longer. Present evidence suggests that the average time of survival in a favourable environment is three days, but circumstantial evidence suggests a longer period of survival in some instances.<sup>2</sup>

**Sperm  
survive  
longer  
than ova**

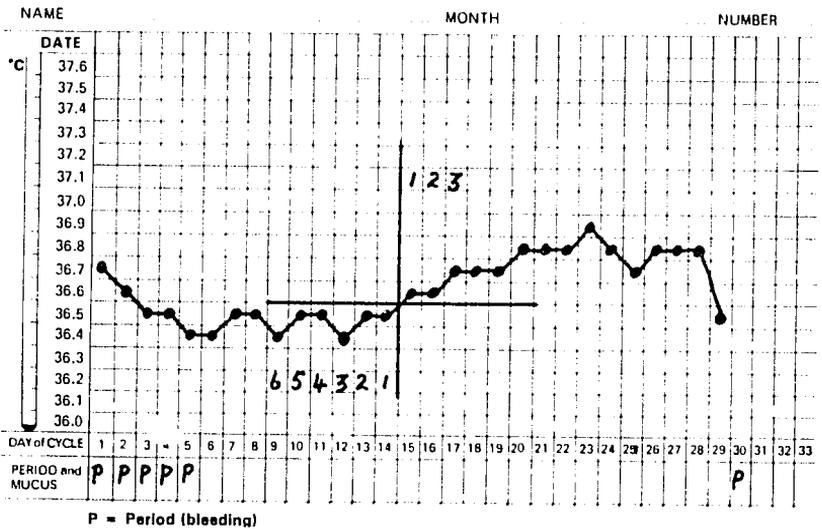
Silverman *et al.*<sup>57</sup> found sperm with some regularity in cervical smears up to seven days after sexual intercourse, but it must be stressed that the finding of sperm does not mean that they were capable of fertilizing ova. The evidence from other species suggests that sperm retain the capacity to fertilize for only 48 hours;<sup>54</sup> clinical experience suggests that this is too short an estimate for humans. An average survival of three days with a small but significant number of sperm surviving longer (e.g. 5-7 days) seems to be more accurate.



the next in 83% of cycles, slowly over a number of days in 15% (Fig. 3b) and in a step-like manner in 2% (Fig. 3c). A saw-tooth type of rise occurs rarely.



**Fig. 3b.** Basal body temperature chart with slow rise due to ovulation demonstrated by the three over six rule.



**Fig. 3c.** Basal body temperature chart with step-rise due to ovulation demonstrated by the three over six rule.

## The method of recording

A proper recording technique is essential to obtain charts that are easy to interpret. It is not difficult, and most women can be taught successfully.

The following points are important:

(1) A special ovulation thermometer, though not essential, is extremely helpful, as the expanded scale (36°C-38°C covering the whole thermometer) makes it easy to read.

**Special thermometer helpful**

(2) The temperature must be recorded immediately on waking in the morning before getting out of bed or doing anything, including drinking a cup of tea or coffee.

(3) Because the temperature changes according to the time of day, the recording should be made as far as possible at the same time each day.

(4) The temperature may be recorded orally, rectally or vaginally. Oral temperature readings are satisfactory if carried out correctly. However, rectal or vaginal recordings give more regular charts which are easier to interpret, but some women may find these sites unpleasant or distasteful to use. There is a recorded instance of a vaginal thermometer being found in the urinary bladder.<sup>45</sup> It is important to keep to whatever site is chosen for all temperature recordings. Although thermometers are often marked as half-minute, they should be left in position for three minutes in the case of rectal and vaginal recordings and four to five minutes for oral recordings.

**Site of temperature recording**

(5) If the mercury stops between two marks, it should be recorded as the one below; for example, if the mercury stops between 36.7° and 36.6° it is marked on the chart as 36.6°. This is an important 'fail-safe' proviso when applying the rules for recognizing a significant rise of temperature.

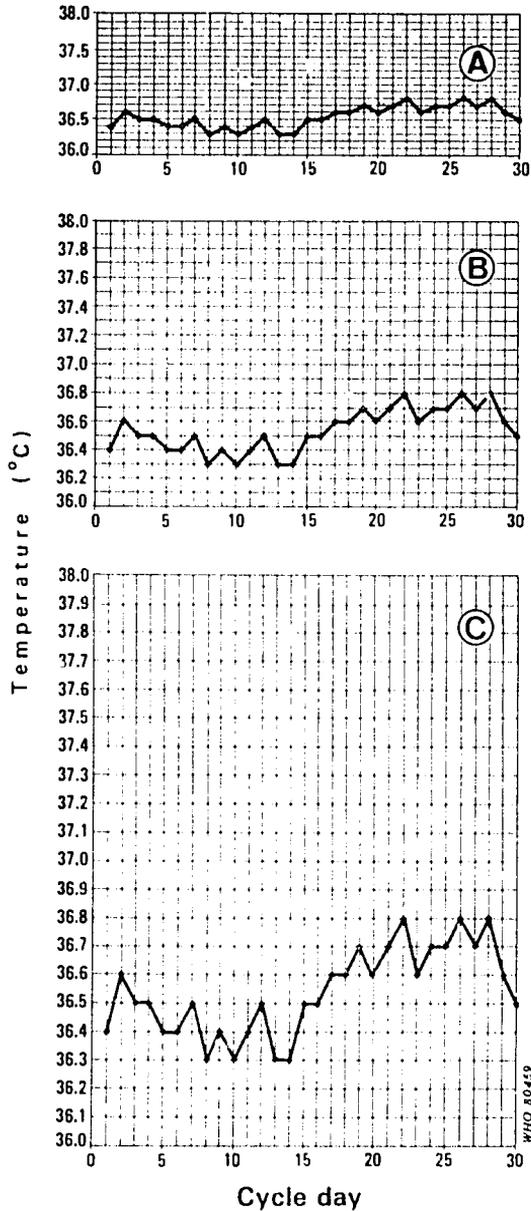
(6) The temperature should be marked by placing a dot in the centre of the appropriate square on a properly designed chart. A proper design requires 5 mm squares as a minimum. Charts employing oblongs greater in height than width are also satisfactory, and may show a temperature shift hidden on a chart that is more square (Fig. 4). On all charts the dots are joined progressively by a continuous line.

**Properly designed charts**

(7) A new chart should be started on the first day of menstruation so that the time of the temperature shift in relation to the cycle length can be seen at a glance.

## Recognition of the shift

Accurate recognition of the temperature shift associated with ovu-



**Fig. 4.** The same biphasic temperature curve drawn on three different temperature scales with a common time scale: (A) horizontal: vertical axes, 0.5:1; (B) 1:1; and (C) 2:1.

Source: Spieler, J. M. (1981) Self-detection of ovulation and the fertile period. In *Research on Fertility & Sterility*, eds. J. Cortés-Prieto, A. Campos da Paz & M. Neves-e-Castro, p. 38. Lancaster: MTP Press.

lation and the ability to distinguish it with confidence from a rise of temperature caused by other events is crucial to the use of the BBT method. About 10% of charts can cause difficulty in interpretation, but an experienced user may not have difficulty. In order to facilitate learning, a number of rules of thumb have been developed, any of which can be applied and will give an inexperienced person the correct answer, removing the need for subjective judgement.

**Rules of  
thumb for  
recognition**

### *Three over six rule*

The simplest of the rules which can be applied to a recording on a centigrade chart marked with  $0.1^{\circ}\text{C}$  divisions or a Fahrenheit chart with  $0.2^{\circ}\text{F}$  divisions is the three over six rule.

*Rule:* As soon as you have recorded three consecutive daily temperatures, all of which are above the level of the previous six consecutive daily temperatures, excluding temperatures taken on days 1-4 of the cycle and any false rises, you are in an infertile phase.

This rule can be applied graphically as follows:

As soon as you can place an elongated cross on the chart which coincides with the lines of the chart and gives three consecutive daily temperatures in the top right-hand segment and six consecutive daily temperatures in the bottom left-hand segment, you are in an infertile phase.

This is illustrated in Fig. 3a with an acute shift. It can be applied equally to slow and step-like rises (Figs. 3b and 3c). The cross can be pencilled in on the chart and erased if it does not fit. Alternatively, a cross can be drawn on a transparency which can then be placed over the chart to see if the rule of three over six has been fulfilled. If there is more than one 'spike' temperature on the chart (see below) it may be difficult to interpret.

### *Spike temperatures*

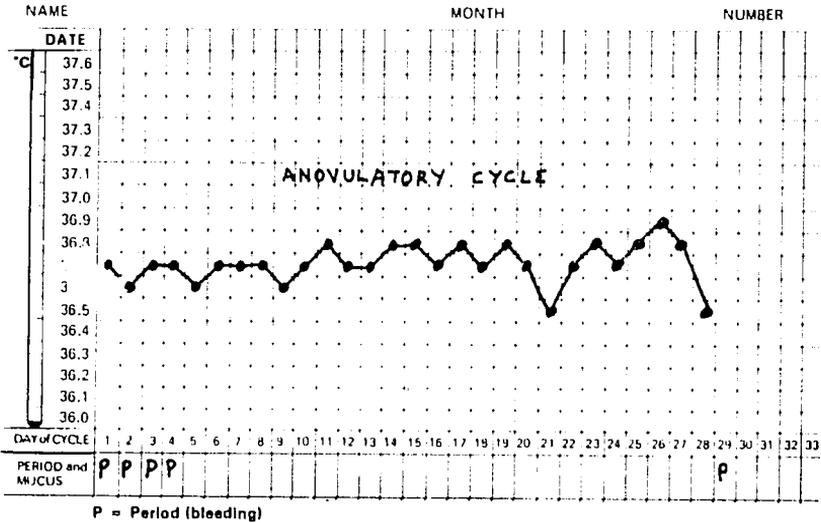
Occasionally a chart is interrupted by a spike temperature, a spike being defined as a temperature which is usually more than  $0.2^{\circ}\text{C}$  above its immediate neighbours. A spike may be caused by a mild infection, consumption of alcohol the previous night, or by taking the temperature later than usual, because the temperature is higher by about  $0.1^{\circ}\text{C}$  for each hour later than the usual time of recording.<sup>53</sup> It is permissible to ignore *one* spike among the six consecutive temperatures at the lower level (Fig. 5). Occasionally the first or second reading after six low readings may have risen by more than  $0.2^{\circ}\text{C}$ . This should not be confused with a spike.



## Unusual BBT charts

Anovulatory cycles occur from time to time in healthy women. They are more frequent at the beginning and end of reproductive life and during lactation. Their presumptive occurrence is indicated by a monophasic chart, the shift of temperature from a lower to a higher level being absent (Fig. 6). A woman is normally in an infertile phase

**Monophasic charts**



**Fig. 6.** Basal body temperature chart showing absence of shift in an anovulatory cycle.

throughout an anovulatory cycle, but unfortunately cannot know the cycle is anovulatory until the end. She has to abstain from sexual intercourse throughout the cycle if using the BBT method alone. An anomaly is that monophasic charts can sometimes occur with ovulatory cycles.<sup>66</sup>

The temperature may be affected by intercurrent febrile illness. This may prevent recognition of the shift of temperature at ovulation, though often it can be recognized despite the intercurrent illness (Fig. 7). The temperature may not always be taken under basal conditions or at exactly the same time during the day. These factors may all make interpretation of a chart difficult and inaccurate.

### The coverline

An alternative method of recognizing a significant shift in the temper-

ature, indicative of ovulation, is known as the coverline. The rules for this are:

- (1) Ignore the temperatures of the first four days of the cycle and any later temperatures which are obviously elevated by an incidental disturbance.

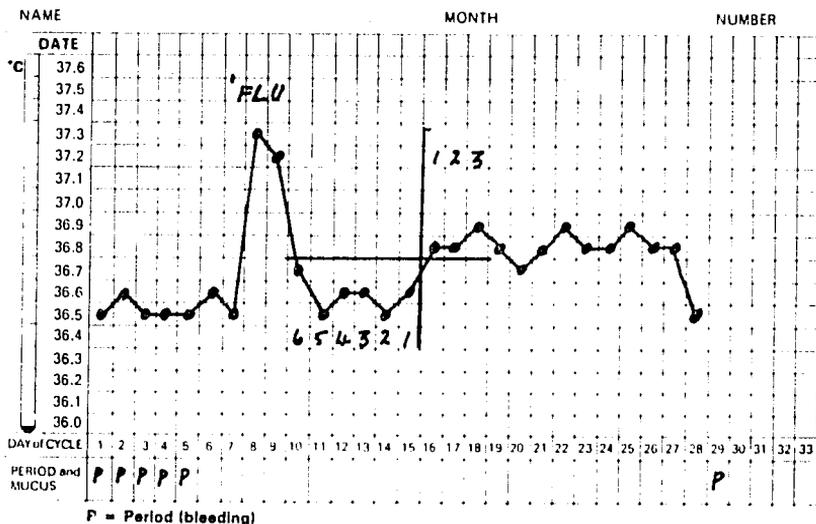


Fig. 7. Basal body temperature chart marred by influenza but still showing an ovulatory rise.

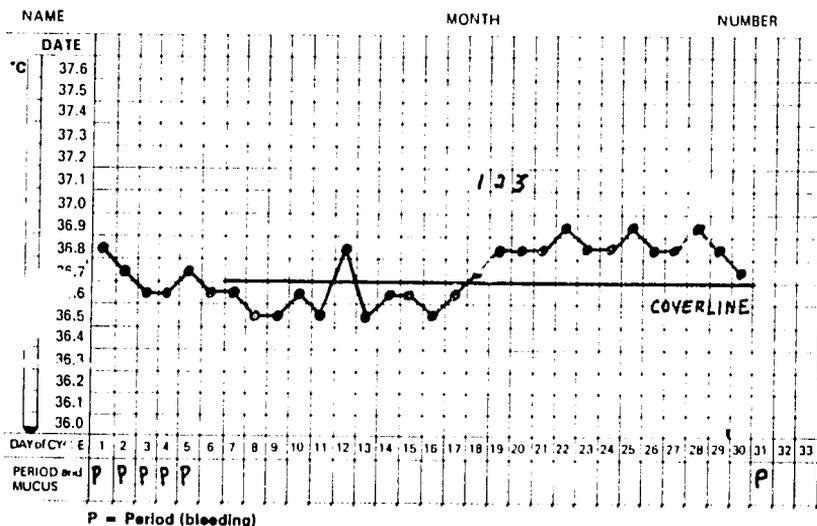


Fig. 8. Basal body temperature chart showing ovulatory rise determined by use of a 'coverline'.

- (2) Identify the highest of the remaining temperatures in the pre-ovulatory phase of the cycle and draw a horizontal line across the chart coinciding with the line on the chart immediately above it.
- (3) Ensure there are at least six temperatures *below* that line.
- (4) Identify the first three temperatures *above* the line.
- (5) The post-ovulatory infertile time commences as soon as the third temperature above the line has been recorded (Fig. 8).

This method is not entirely objective as it involves a subjective judgement as to which elevated temperatures can be ignored on the grounds that they are thought to be caused by an incidental disturbance.

### *Vollman's rule (1977)*<sup>66</sup>

The method involves adding up all the temperatures of the *previous* cycle from day six to the end and calculating the average. A line is then drawn at that level on the chart of the *present* cycle. The post-ovulatory infertile time is taken as beginning on the day after three temperatures have been recorded above that average line.

This clearly involves calculations which would deter some users, particularly refinements of the rule, such as omitting from the calculation temperatures which are 0.1° or 0.2° Fahrenheit (or the centigrade equivalent) below the line.

**More complicated calculations**

Some instructors of the method consider a rise of temperature to be significant only if fertile-type cervical mucus is no longer present.<sup>52</sup> This approach is dealt with in the section on the sympto-thermal method.

### *Conclusion*

Among the various ways of recognizing a significant shift of temperature, the three over six rule, allowing one spike temperature among the six, is probably the easiest to use.

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## *Cervical mucus method*

Under the influence of oestrogen and progesterone the mucus secreted from the crypts of the cervix undergoes cyclical changes which are recognizable at the vaginal entrance (the vulva). These physiological changes form the basis of the cervical mucus method.

**Mucus  
changes  
during cycle**

In the usual cycle of around 28 days, during the days immediately following menstruation the mucus forms a thick, viscid plug which occludes the cervix. With no free cervical mucus at this stage, the vulva has a dry feeling—the 'dry days'. Under the influence of the rising level of circulating oestrogen the mucus gradually changes, first to a thick viscid substance which begins to come down the vagina and appear at the vulva, and subsequently to a thin, watery, highly lubricative elastic substance which flows more freely. These changes are best developed around the time of ovulation. The 'peak', which is the last day of the thin watery elastic mucus, can only be recognized retrospectively. This has been shown to occur from three days before to two days after ovulation as suggested by measurement of hormonal changes.<sup>3</sup> After ovulation, under the influence of progesterone, the mucus becomes thick and viscid again.

**The peak  
symptom**

### **Recognition of changes in mucus**

Women may recognize the changes in their cervical mucus by the sensations they experience in their genital area and by the observations they make of the mucus. Some women are unhappy at the idea of feeling their own genital organs. This method is then unlikely to be appropriate for them, unless sensation alone is enough for them to recognize changes in the mucus.

**The 'dry  
days'**

During the days immediately following menstruation a woman may be conscious of a positively dry sensation at the vaginal entrance, and inspection of a paper tissue, if available, applied to the vulva, before and after urination, will reveal no mucus. These days are commonly

referred to as 'dry days'. If the woman has no paper tissues or their equivalent, and this applies in much of the developing world, she will have to observe her underclothing or feel her vulva to check on the state of the mucus, unless she can recognize the sensation sufficiently well.

The first appearance of mucus will be heralded by loss of the positively dry sensation which follows menstruation. It may not be appropriate to describe the sensation as wet (because the first mucus is thick and sticky), but there is definite loss of the positively dry sensation. A paper tissue or finger applied to the vulva at this stage may show a thick, sticky, cloudy or opaque mucus which is not elastic. This last feature can be demonstrated by folding and then separating the leaves of the paper tissue, when it will be observed that the threads of mucus do not stretch.

**First appearance of mucus—thick and sticky**

These changes begin on average six days (range three to 10 days) before ovulation,<sup>3,10</sup> but longer ranges have been reported.<sup>16</sup>

As ovulation approaches, further changes occur, the sensation at the vaginal entrance being one of dampness or wetness coupled with an awareness of a slippery or lubricative feeling. The labia slide easily one over the other. An applied tissue or finger will reveal a thin, clear, lubricant mucus which is extremely elastic—fertile-type mucus. When a folded paper tissue is opened, threads of mucus stretch easily between the leaves without breaking. One analogy for mucus at this stage is the characteristics shown by the white of a raw egg. Strict vegetarians and others who are not familiar with the white of an egg may know the okhra or ladyfinger vegetable. When this is cut open a sticky white substance can be seen or felt. This is also analogous to fertile-type mucus. If 'mid-cycle' bleeding occurs, the mucus may be tinged with blood and appear slightly pink.

**Thin, clear, lubricant mucus near ovulation**

The last day on which the fertile-type mucus is felt or seen is known as the 'peak symptom' or 'peak day'. It must be stressed that this is not the day of maximum quantity of mucus; it is the last day of lubricative, watery elastic mucus. This can only be determined in retrospect. The day it becomes apparent to a woman that her mucus has changed and is no longer lubricative and elastic as it was the previous day, she knows that the peak symptom occurred on that previous day.

**Recognizing the peak symptom day**

Following the peak, mucus either disappears so that the vaginal entrance again becomes dry, or infertile-type mucus (thick and sticky) may be present for one or several days. These conditions persist until the next menstruation.

**Infertile-type mucus returns**

In various studies and surveys, from 7% to 25% of women have some difficulty in interpreting their mucus changes.<sup>47</sup> The type of mucus and its timing can be disrupted by intercurrent infection, cervical pathological changes, and some medication. In the WHO

prospective study<sup>74</sup> it was shown that in cycles of an average length of 28.6 days the mean number of days of abstinence required by the cervical mucus method was 15.4, that is, more than half the cycle.

## Recording the mucus changes

### Keeping a mucus chart

Observations should be made at convenient times throughout the day, as when going to the toilet. After urination, a hanging thread of fertile-type mucus can sometimes be seen. The day's observations are marked on a chart each night. This may be done by letters (such as D for dry, M for mucus), symbols, or by the use of coloured stamps. It is important, however, that reliance should not be placed on these markings alone, but that a word or two of description of the mucus, such as thick, sticky, clear, thin, slippery, white, etc., should be written. The pattern of change is common to all ovulating women, but there are individual characteristics within that pattern which a woman can be taught to recognize. To achieve this she must record them objectively rather than seek to conform to a general description.

Whatever system of recording is used, peak (determined in retrospect) is conveniently marked by a cross and the following three days numbered 1, 2, 3 (Fig. 9). If fertile-type mucus reappears, then the peak day may have been incorrectly recorded. Three days must again be counted from the new peak.

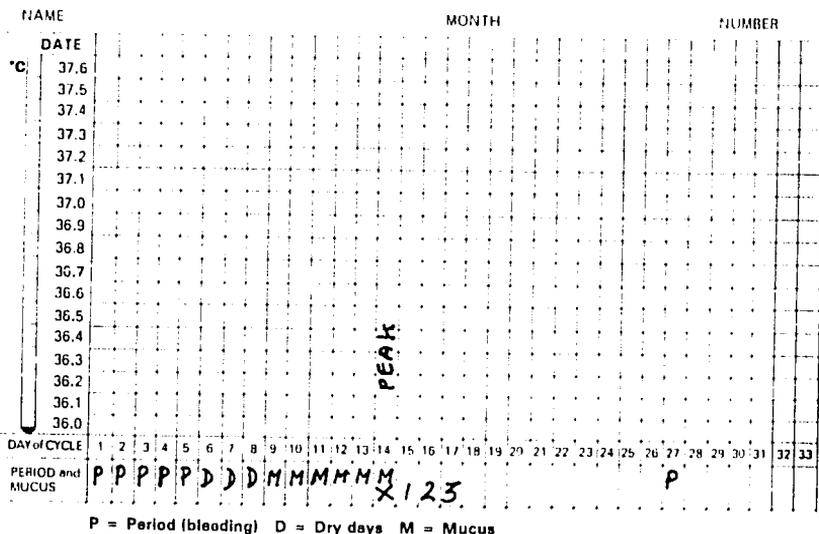


Fig. 9. Chart showing convention for marking of peak mucus.

## The timing of sexual intercourse

In the method described above sexual intercourse can take place on alternate dry days immediately following, but not during, menstruation. As soon as there is the first sign of mucus, shown either by loss of the positive dry sensation or by the presence of mucus on a paper tissue or finger, abstinence must begin again.

During the dry days it is recommended that sexual intercourse takes place not more often than every second day. This recommendation is made to avoid the danger of the first appearance of mucus being obscured by the dampness caused by residual semen in the vagina the day after sexual intercourse.

Abstinence continues until the fourth day after peak. Thus, if peak is marked with a cross and the next three days are numbered 1, 2, 3, sexual intercourse begins on the first unmarked day and may continue until the beginning of the next menstrual period.

### *Absence of dry days*

In some cycles, particularly those of 26 days or less, mucus may appear immediately after menstruation, there being no dry days. This is because the rising level of oestrogen, which begins early in short cycles in which ovulation is taking place early, brings about a corresponding change in the mucus. In these circumstances sexual intercourse cannot take place from the first day of menstruation until the fourth day after peak.

### *Patches of mucus*

In long cycles and in special circumstances such as during breast-feeding and the time of pre-menopause, fluctuating levels of oestrogen may cause mucus to appear for two or three days, to be followed by a reversion to dry days. Two or three days of mucus are often called 'a patch of mucus'. A patch may occur once or twice (or in very long cycles a number of times) before evolution takes place to the thin, lubricative fertile-type mucus with its peak. Abstinence from sexual intercourse must be observed during all the days of a patch of mucus and for three days after, sexual intercourse being resumed on the fourth day. The reason for the abstinence being continued after mucus has disappeared is, first, to be certain that dry days are properly re-established and, second, in case the mucus patch did in fact mark ovulation.

**Abstinence  
needed  
during  
mucus  
patches**

## *Unchanging mucus*

In long cycles mucus may appear after the usual post-menstrual dry days, but instead of undergoing a progressive change towards fertile-type mucus it may retain its initial characteristics for a number of days. The mucus remains thick and sticky, and does not differ from one day to the next. It has been suggested that this mucus is unfavourable to the migration of sperm, so that sexual intercourse can take place without risk of conception. The reliability of this suggestion has not been established by valid field trials, hence it seems unwise to recommend this at present. Indeed there is some evidence to suggest that sexual intercourse at this time may carry considerable risk of conception.<sup>1</sup>

**High con-  
ception risk  
with  
unchanging  
mucus**

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## *Cervical palpation*

This method depends on detecting changes in the cervix by self-palpation by the woman. Not all women like to insert their fingers into their genital tracts, for personal or cultural reasons. Thus women using this method have to be carefully selected.

During the non-fertile phase the cervix is firm, having the consistency of cartilage, and the external os is closed. Also the cervix is low in the pelvis. As the level of oestrogen rises with the approach of ovulation, the cervix becomes soft, the os opens and the cervix rises in the pelvis.<sup>21,22</sup> However, there does not appear to have been any study of the reliability and consistency of these changes, correlating them with FSH or LH levels in the blood stream.

**Cervical  
changes as  
oestrogen  
rises**

### **Recognition of the changes**

Palpation is best carried out with the woman standing with her left foot resting on a stool or chair (right foot if she is left-handed). The middle finger of the right hand is inserted into the vagina and the cervix palpated and the os explored.

The distinction between soft and firm is readily achieved once a woman has palpated the cervix through one cycle. Some idea may be given by the comparison that the contrast between a firm and soft cervix is like that between the tip of the nose and the lower lip. However, it is more important that the woman learns by her own observations through one cycle rather than that she tries to conform to an expected pattern.

**Learning to  
palpate the  
cervix**

The closed cervical os does not admit the tip of the finger, whereas the open cervical os is perceived as a definite dimple or may even admit the fingertip. The low cervix can be felt with ease, whereas the high cervix may be difficult to reach. This last is the symptom most frequently and readily recognized.

In the days immediately following menstruation the cervix will be

firm, closed and low. About four or five days before ovulation the beginning of softening will become apparent, the os will gradually open and the cervix will be less easily reached.

Following ovulation the cervix hardens and closes, and descends slightly within one or two days.

Sexual intercourse must be avoided from the time when the first changes in the cervix are detected, and abstinence should continue until it is again firm and closed.

## **Combination with mucus changes**

Palpation of the cervix can be combined with observations on the state of the mucus. When the mucus is changing to the fertile-type it adheres to the tip of the finger, so that its characteristics can be observed when the finger is withdrawn. Some advocates of the use of cervical mucus alone to determine the fertile and infertile phases of the cycle are opposed to cervical palpation, declaring that it is unnecessary and may interfere with interpretation of the condition of the mucus. There are, however, no definite data to indicate that this is so.

Cervical palpation can be of particular help during breast-feeding or the pre-menopause, when temperature and mucus changes may be difficult to interpret. It is also a suitable method for the blind who wish to be independent of outside help.

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## *Sympto-thermal method*

Some teachers insist that the use of cervical mucus alone is sufficient, stating that combining it with other indicators of ovulation may be less reliable than mucus alone. Another argument put forward by those who advocate the cervical mucus method alone is that taking and interpreting daily temperature readings makes the combined method too complicated for many women in developing countries. This objection seems unjustified.

In practice, field trials have indicated that the sympto-thermal method has better use-effectiveness than the cervical mucus method (see page 41). When, for example, it is the beginning of the post-ovulatory infertile phase that is being determined by observation of the mucus and the temperature, the later of the two indicators is taken as the starting point. This gives greater security to the user.

During the learning period, which may last up to six months, it is essential that the woman should be closely supervised to ensure that she knows how to interpret the signs of ovulation. This, of course, requires more trained staff to monitor women learning the method (see page 47).

**Long period  
of instruc-  
tion needed**

Most instructors advocate combining temperature recordings with observation of symptoms in what is known as the sympto-thermal or muco-thermal method. The two indicators most commonly used are the cervical mucus and the BBT. To these may be added cervical palpation, and observations on ovulation pain (*Mittelschmerz*) or mid-cycle bleeding. As pain and bleeding do not occur regularly in many women, the majority rely on cervical mucus and BBT as the mainstay of the sympto-thermal method.

### **Recognition of the changes**

The observations to be made are those already described in the sections on the BBT (see page 14) and cervical mucus methods (see

page 23). The BBT is recorded each morning and marked on a chart; the state of the cervical mucus is noted at suitable times throughout the day and recorded each evening.

## Timing of sexual intercourse before ovulation

The time for sexual intercourse immediately after menstruation is determined by the state of the cervical mucus. Sexual intercourse may take place on alternate dry days only, that is days when no cervical mucus can be detected by sensation or observation at the vaginal entrance. As soon as the first mucus appears, abstinence must be observed and continued (except in the case of long cycles with patches of mucus) until some days after ovulation.

There is a risk posed to those women in whom mucus is difficult to detect because it is slight in amount or appears later than the usual four or five days before ovulation. In such cases sexual intercourse should be stopped from a fixed day in the cycle. This day is calculated by subtracting 20 (or 18 according to the degree of security sought) from the number of days in the shortest of the last six cycles (see page 33). For example, if the shortest cycle was 27 days:  $27 - 20 = 7$ ; so abstinence must be observed on day 7 and after, counting the first day of menstruation as day 1. Thus, in this example sexual intercourse may take place on dry days but must not take place on day 7 and after, even though the days still appear to be dry. Should mucus appear before day 7 sexual intercourse must cease at that point.

Dealing  
with slight  
or late  
mucus

## Timing of sexual intercourse after ovulation

Sexual intercourse may be resumed after ovulation on a day determined in one of two ways. The BBT chart may be the sole criterion, sexual intercourse beginning as soon as three consecutive daily temperatures, all of which are above the level of the previous six consecutive daily temperatures, have been recorded (see page 19). In this approach peak mucus is used only in a supporting role, confirming the significance of a shift of temperature where, for instance, an earlier than usual rise, though fulfilling the rule of three over six, may create anxiety.

The second way of determining the beginning of the post-ovulatory infertile phase is to give both temperature shift and peak mucus equal weight. Neither is given priority; the third temperature after the shift and the fourth day after peak mucus must both be recorded before sexual intercourse is resumed. This is known as the double-check method.<sup>62</sup>

Temper-  
ature and  
mucus  
given equal  
weight

Other symptoms such as pain, bleeding, cervical palpation, etc. may be used in a supporting role, acting as confirmation of the significance of a temperature shift or peak mucus. Some women experience pain which is so distinctive that they come to rely on this alone, a practice which should not be encouraged. Pain does not give sufficient warning of the approach of ovulation, and, definite though the symptom may usually be, other pains may occasionally be mistaken for it.

**Supporting  
symptoms**

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## *Calendar method*

Limited  
value

The calendar method when used on its own is associated with a high failure rate and should not be taught alone as a method for regulating births. This is not because the physiological principles underlying its determination are at fault, but because it relies on prediction of the length of future cycles on the basis of records of past cycles, a prediction which can only be made with a limited degree of statistical probability. However, for women whose periods are completely regular, it may have a place and they should have the method properly explained if they want to use it.

Past cycle  
lengths  
relied on

The method relies on the observation that ovulation occurs about 16 to 12 days before the beginning of the next menstruation. On the basis of the length of past cycles, the time of the next menstruation is predicted, and counting back from that date the approximate time of ovulation is determined. To this an allowance must be added for the life of the sperm and ovum. The end result is a block of days in which sexual intercourse is likely to lead to conception. Days before and after that time are likely to be infertile.

The length of at least six consecutive cycles is required to enable a reasonable prediction of the length of the next three cycles to be made. Statistical analysis of a large amount of data has shown that 82% of the next three cycles will fall within the range of the last six cycles.<sup>30</sup> Increasing the number of past cycles to 12 only raises the prediction to 90%.

Commonly  
used  
formula

A number of formulae have been devised to make application of this information easy. They differ from one another in the allowance they make for the life of sperm and ovum. One commonly employed is:

Shortest cycle - 20 = first fertile day

Longest cycle - 10 = last fertile day

For example, if the last six cycles were 28, 26, 28, 29, 27, 29:

26 - 20 = 6

29 - 10 = 19

Therefore, abstinence should be observed from day 6 to day 19 of the cycle inclusive, the first day of menstruation being recorded as day 1. Some instructors subtract 18 from the shortest cycle and 11 from the longest cycle, lessening the period of abstinence but also the margin of safety.

Notwithstanding its unreliability and the long period of abstinence it requires, this method of family planning is still used by many couples in all parts of the world.

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## *Psychological and motivational aspects*

**Using the fertile days for a wanted pregnancy**

Knowledge of the physiology of ovulation and the menstrual cycle provides a couple with awareness of their own fertility. Combined with periodic abstinence, this forms a method of family planning free from biological side-effects. Also, unlike all other methods of family planning, it may help a couple achieve a wanted pregnancy by indicating to them the most fertile phase of the cycle for sexual intercourse.

Some couples find the method difficult, others feel it enhances the psychosexual side of their marriage. Abstinence, sometimes for more than half the cycle (see page 25), may create psychological problems that must be faced.

**Increased androgens at mid-cycle**

There may be a physiological reason for the dissatisfaction that abstinence during the most fertile phase of the menstrual cycle can cause. It has been shown that an increase in ovarian stromal tissue in the late follicular phase of the normal cycle is associated with a 15% increase in androstenedione and a 20% increase in testosterone in the peripheral circulation. Androgen production in the female at mid-cycle serves two purposes: (a) a local ovarian role to increase the atresia of ovarian follicles, and (b) a systemic effect to stimulate libido. This effect serves to increase sexual activity at the time most likely to achieve pregnancy. If this increased libido in the female is frustrated, psychological problems can result.<sup>60</sup>

**Lack of spontaneity**

Some estimate of these problems was made in a survey of 410 couples who used periodic abstinence, in which each partner anonymously and independently completed a detailed questionnaire.<sup>34</sup> Altogether, 93% of the men and 78% of the women found abstinence often or sometimes difficult, while 30% of the men and 27% of the women found sexual intercourse lacked spontaneity. Against this, 66% of the men and 77% of the women said the method was satisfactory, and 74% and 75% of men and women respectively felt it had helped their marriage.

Lack of spontaneity and of satisfaction from sexual intercourse

during the post-ovulatory infertile phase may be made worse in some women by premenstrual tension which may require treatment in its own right. Anxiety about an unplanned pregnancy is frequent when people are learning the method, but is less common among established users.

Abstinence from sexual intercourse may not be difficult for couples who have learnt to practise abstinence of various kinds for religious or other reasons. In the culture of India, for example, fasting, lack of sleep, silence and other forms of abstinence are commonly practised.

## Motivation

Motivation is an important factor in the effectiveness of any form of family planning. Nowhere is it more important than in the practice of periodic abstinence with its daily decision-making on the part of both partners, and periods of abstinence from sexual intercourse which at times may be prolonged. This is clearly reflected in the difference in effectiveness between those who want no more children, having completed their family size, and those who are only seeking to space births. Use-effectiveness is more than twice as good in those who want no more children (who are most strongly motivated to succeed with the method) than it is in those spacing their family (to whom a further pregnancy would not matter too much).<sup>31,47</sup> Also, the importance of motivation is shown in the wide difference between theoretical or method-effectiveness rates for periodic abstinence and the actual use-effectiveness rates. Many couples fail to use the method properly owing to lack of motivation to abstain.

Daily  
decision-  
making

Motivation can be developed and maintained in various ways. An understanding of the physiological principles underlying the method is important and must be given to all couples. A low level of education need not be an obstacle, as the essential principles can be explained at a suitable level to all. This 'fertility awareness' becomes part of a person's self-awareness, promotes interest and understanding, and removes the psychological obstacle created when people are simply given rules to follow blindly. Even so, a low level of education can hamper the use of all family planning methods, including periodic abstinence. It may make it more difficult for the person or couple to understand the practicalities of the techniques of the method as well as the importance of family planning. It may make it more difficult to keep sufficient motivation going to continue the use of the chosen method.

Fertility  
awareness

Instruction of both partners is important if the difficulty created by one partner indicating when the couple can or cannot have sexual

**Both partners must share responsibility**

intercourse is to be avoided. Both must share the responsibility and recognize that some modification of their pattern of sexual behaviour is likely to be required, involving periods of abstinence from sexual intercourse which they may find difficult. At the same time, it should be explained that sexual intercourse is not the only way in which love may be expressed, and that mutually accepted periods of abstinence can enhance subsequent appreciation of sexual intercourse. Communication between them on these matters is essential and it is claimed that it can lead to better communication about wider aspects of their relationship.

## **Combined use of methods**

**Barriers during the fertile phase**

Because of the difficulty of periods of abstinence, some couples make use of barrier methods during the fertile phase. This is particularly so among those couples in whom abstinence may otherwise be prolonged because of the pattern of cycles or because one partner's work takes him or her away from home. Combination with barrier methods is also found in those who have no strong moral or religious reasons for using periodic abstinence but who still prefer to use no method during the infertile phase of the cycle. If barrier methods are used during the fertile phase, it is important for couples to observe the signs of fertility and infertility with the same care as they would if abstaining during the fertile phase. This is also sometimes known as 'fertility awareness', where the couple are aware of the fertile phase of the cycle and use other contraceptive methods at this time. Using barrier methods in a haphazard fashion around the time which they 'think' may be the fertile phase is a recipe for failure.

**Ovulation signs important when combined with barriers**

Conversely, those who rely mainly on barrier methods but find them somewhat irksome often do not use them during what they think may be the infertile phase of the cycle. Instructors must ensure that these couples observe the signs of ovulation with the same care as those who are relying solely on abstinence during the fertile phase. Combining observation of the signs of ovulation and use of barrier methods is currently the practice of many couples.

In some cases couples use coitus interruptus during the fertile phase if they do not want to have the trouble of using a diaphragm or a condom. The same observations about the importance of making sure when ovulation has occurred apply to this combination of methods.

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## Effectiveness

Many advocates of forms of periodic abstinence for family planning claim that if the method is used exactly according to the instructions for its use, its effectiveness is very high. This form of effectiveness is called *theoretical*—or *method-effectiveness*, and may be higher than that experienced when the method is actually used by people in differing conditions. This latter form of effectiveness is called *use-effectiveness*. Billings<sup>4</sup> claims a 97.1-99.5% theoretical effectiveness in preventing pregnancy using the cervical mucus method, but very much lower use-effectiveness rates have been found in a number of well-conducted field trials (see page 40). The distinction between these two levels of effectiveness is important, for it distinguishes between what should happen (in theory) and what actually happens when the method is used. The distinction is particularly important in relation to forms of periodic abstinence because it is difficult to be certain that the person using the method has been sufficiently well instructed or has understood and been able to practise the procedures involved.

**Terminology used**

**Distinction between method- and use-effectiveness**

Another term sometimes used is *extended* use-effectiveness which takes account of all unplanned pregnancies that occur during the course of a study irrespective of whether the method is used correctly or incorrectly (use-effectiveness as described above), but also includes unplanned pregnancies that take place during a defined (extended) period of time following discontinuation of the method for any reason. The only pregnancies excluded from this calculation are those deliberately planned.<sup>64</sup>

All these measures are important. Method-effectiveness indicates what can be achieved under ideal conditions; use-effectiveness indicates the result likely to be encountered in every-day life. A wide gap between method- and use-effectiveness deserves investigation. It may indicate that a method is too difficult for the average user and needs to be modified in some way. On the other hand, it may indicate that users have not been properly instructed or given the necessary supporting service, in which case the remedy is obvious.

**Use-effectiveness most practical index**

Effectiveness is usually expressed in terms of the number of un-

**Pearl  
formula**

planned pregnancies occurring during the period of the survey. Traditionally the *Pearl formula* has been used: this divides the number of pregnancies by the number of months of use by all participants, the answer being multiplied by 1,200 to enable the result to be expressed in terms of pregnancies per 100 women per year. The Pearl formula is somewhat crude because, on the one hand, it fails to take into account the period of time the method is used and, on the other hand, it ignores the possible influence of other competing unwanted side-effects. Despite its shortcomings, the Pearl formula provides a useful rough and ready comparison between methods.

**Life-table  
method**

One common alternative way of expressing effectiveness is by the *life-table method*. Put simply, this defines the chances of a particular event occurring (e.g. pregnancy) within a defined period of time, while taking into consideration the chances of other competing reasons for discontinuing use of the method.<sup>49</sup> This gives a more precise measure of effectiveness, for it is closer to the real-life situation than the Pearl formula. One great advantage is that the life-table method shows the relationship between the chance of events occurring soon after commencing use of the method and those same events occurring after the method has been used for some time. Unlike the Pearl formula, its use requires some statistical expertise, and access to a good calculator (or desk computer) is essential.

**Prospective  
surveys  
most  
informative**

Assessment by trials conducted and analysed in accordance with the well-established scientific criteria and using the life-table method first described by Tietze and Lewit<sup>64</sup> should continue. Trials may be retrospective or prospective. Retrospective surveys are rarely satisfactory, as the proportion of defaulters from a routine service provision is usually high and it is impossible to discover why they defaulted. Properly conducted prospective surveys are better able to secure reliable data. The constant surveillance, however, is likely to increase motivation; hence the result will be better than is to be expected in a routine service. Nevertheless, a prospective survey can give a useful measure of what may be achieved. The most important criterion of effectiveness is the pregnancy rate, but there are others associated with other defined reasons for discontinuation.

**Motivation  
crucial**

The success of *all* methods of birth regulation depends heavily on the motivation of the couple, which in turn is influenced by the quality of instruction given when the couple is first introduced to the method. This applies particularly to periodic abstinence, the quality of initial instruction and subsequent support being crucial. Another important motivational factor is whether the couple are seeking to space their family or to limit it when they have completed their desired family size (see page 36). Those couples spacing their children appear to be less determined to ensure the method is effective than those couples who have definitely decided to have no more children.

## Basal body temperature method

A prospective study of 321 couples in the UK using the BBT method throughout 4,749 cycles gave a user-failure rate of 6.6 pregnancies per 100 woman-years and a method-failure rate of 1.2 among those who accepted the longer period of abstinence and confined sexual intercourse to the post-ovulatory phase.<sup>31</sup>

A study in West Germany involving 307 highly motivated couples through 11,352 cycles gave a user-failure rate of 0.8<sup>8</sup> when sexual intercourse was restricted to the post-ovulatory phase only.

## Cervical mucus method

A wide range of effectiveness has been reported in trials of the mucus method which permits sexual intercourse in both the pre- and post-ovulatory infertile phases. User-failure rates per 100 woman-years have ranged from 5.3 in India,<sup>35</sup> through 14-25<sup>4</sup> and 15.5<sup>1</sup> in Australia, 17.7<sup>23</sup> and 20<sup>24</sup> in the USA, 25.4 in Tonga,<sup>68</sup> to 33.8 in Colombia.<sup>36,37</sup> Wade in the USA<sup>67</sup> found a user-failure rate by the life-table method of 24.8. An international collaborative prospective study under the auspices of WHO gave a user-failure rate of 20, with a range of 13-28 among the participating centres.<sup>74</sup> In this study discontinuation (including pregnancies) was 35.6% after 13 months.

Method-effectiveness is very much better, with a method-failure rate as low as 0.06 being reported.<sup>35</sup> The study of Ball,<sup>1</sup> which provides more complete data, gives a figure of 2.9 for method-failure.

The evidence suggests that as many as half the method failures occur following sexual intercourse on pre-ovulatory dry days, especially the day immediately preceding the first appearance of mucus.<sup>1,24</sup> In addition, the peak symptom may on occasion occur too early, so that when sexual intercourse is resumed on the fourth day after the peak the ovum is still alive.<sup>3</sup> Finally, some women may have difficulty in identifying the mucus symptom consistently.

High user-failure rates

Low method-failure rates

## Sympto-thermal method

This has also been examined in a number of studies. A large international<sup>1</sup> study involving 1,022 couples through 21,736 cycles gave user-failure and method-failure rates of 5.0 and 0.9 pregnancies per 100 woman-years respectively.<sup>44,51</sup> The result may have been influenced by a number of couples using other methods during the fertile phase. Among the 723 who did not, the unplanned pregnancy

rate was 6.24. Also the women were over 30 years of age and two-thirds had completed their families. Thus their motivation was particularly high. Other studies include one in the USA with a user-failure rate of 9.4,<sup>67</sup> one in Australia with a figure of 18.5,<sup>19</sup> 22.1 in the UK,<sup>33</sup> and 26.1 in Colombia.<sup>36</sup>

## Comparison of results

The striking feature about these results is the variation between studies and the marked discrepancy between method- and use-effectiveness in all the studies. Table I shows user-failure rates in studies by Medina

**Table I** Effectiveness of the Cervical Mucus and Sympto-thermal Methods in Comparative Studies

Source: Adapted from *Population Reports*.<sup>47</sup>

Author, date, place	Type of study	Pregnancy rate			
		Pearl formula (per 100 woman-years)		Life-table % at 12 months	
		Cervical mucus method	Sympto-thermal method	Cervical mucus method	Sympto-thermal method
Medina <i>et al.</i> 1980, Colombia <sup>36</sup>	Randomized clinical trial	33.8	26.0	24.2	19.8
Wade <i>et al.</i> 1979, USA <sup>67</sup>	Randomized clinical trial	39.7	13.7	26.7	10.9

Sympto-thermal method gives better results

and Wade comparing the cervical mucus method with the sympto-thermal method, and giving results by both the life-table and Pearl formulas. In each case results with the sympto-thermal method were better than those with the cervical mucus method. This may in some instances reflect the quality of instruction, but in others it is an indication of the difficulty some couples encounter in observing the rules for abstinence.

Because of the physiological disturbance which follows childbirth and accompanies the approach of the menopause, evidence of ovulation and of its approach may be more difficult to detect at these times. The duration of the required abstinence from sexual intercourse is likely to be much longer than it is in regular cycles. For this reason the practice of periodic abstinence may be more demanding at these times (see pages 20 & 26), and its reliability more difficult to assess.

## Comparison with other methods of contraception

There are not many studies in which methods of periodic abstinence have been compared directly with other forms of contraception. It is not suitable to take results from different studies and put them together because the conditions under which the studies may have been carried out would probably be very different. However, one such study is reported in *Population Reports*, Series I, No. 3 in 1981.<sup>47</sup> This is a study that was carried out on married women between the ages of 15 and 44 who had unplanned pregnancies during the first year of use of various family planning methods in the USA between 1970 and 1976 (Table II). It is pointed out that most of the women in the periodic abstinence group were using calendar rhythm, but some of them did use the more up-to-date methods.

**Table II** Percentage of Married Women Aged 15-44 who Experienced Unplanned Pregnancy during the First Year of Use, by Family Planning Method, United States, 1970-76

Source: Adapted from *Population Reports*.<sup>47</sup>

Family planning method	All %	Using to prevent any births (limiters) %	Using to delay wanted births (spacers) %
Periodic abstinence	18.8	11.6	25.0
Foam, cream, jelly or suppositories	17.7	16.6	18.4
Diaphragms	14.4	11.4	17.2
Condoms	9.6	7.1	12.3
Intrauterine devices	4.8	2.4	7.1
Oral contraceptives	2.5	2.4	2.5

## Continuation rates

A number of studies have assessed the continuation rates of the use of various forms of periodic abstinence. Overall, these rates have not been as high as those for other forms of contraception, such as oral contraceptives or intrauterine devices. In the last 10 years, several studies have shown that between 33% and 75% of those entering periodic abstinence studies discontinued the method within one year. This compares with about 20% to 30% who discontinued the use of IUDs in a year and 30% to 50% oral contraceptives after one year.<sup>47</sup>

A study by Medina *et al.* in Colombia between 1976 and 1978, which was carried out to compare the cervical mucus and sympto-

Low continuation rates

thermal methods of periodic abstinence, showed that of 566 couples randomly assigned to one or other of the methods, 72.1% of those using the cervical mucus method and 76.7% of those using the sympto-thermal method had discontinued by the end of the first year following the beginning of training.<sup>36</sup> These figures included pregnancies which occurred during that year (24.2% for the cervical mucus method and 19.8% for the sympto-thermal method). Of those who discontinued voluntarily, there were 34.3% among the cervical mucus method users and 38.4% among the sympto-thermal method users.<sup>36</sup>

Another prospective study by Hanna Klaus *et al.*<sup>24</sup> covering the years 1972 to 1977 at six different centres showed a discontinuation rate of 41% after 12 months and 61% after 24 months by the life-table method.

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## *Side-effects*

A method of family planning is judged primarily by its effectiveness in avoiding conception (see page 38) and by its continuation rates (see page 42). Periodic abstinence is not as effective as oral contraception or the use of IUDs except in those couples who do use it properly and carry out correctly all its requirements of measurements of bodily changes and abstinence, sometimes for a prolonged part of the menstrual cycle. Thus the main side-effect of periodic abstinence is the high rate of unplanned pregnancies that accompanies it overall (about 20% in the WHO prospective study<sup>72</sup>). In developing countries particularly, this can mean a high rate of maternal mortality.<sup>47</sup> Also, periodic abstinence, like the use of intrauterine devices and barrier methods, does not have the non-contraceptive beneficial effects of oral contraceptives. These include: a protective effect against benign breast and ovarian tumours, a reduction in pelvic inflammatory disease, a lessened blood loss during menstruation, and a decrease in premenstrual tension and dysmenorrhoea.

**Main side-effect is high pregnancy rate**

Effectiveness in avoiding conception is not, however, the only criterion by which a method must be evaluated. Other side-effects are also important and in some instances may be of special concern.

### **Possibility of congenital defects**

Periodic abstinence has the advantage that nothing has to be done at the time of sexual intercourse which might interfere with the enjoyment of the act, nor does it have any biological side-effects. On the other hand, anxiety has been expressed that there may be an increased risk of spontaneous abortion and congenital defects among the offspring. This is because a large proportion of failures will be the result of sexual intercourse near the beginning or end of the fertile phase, with fertilization likely to be by an aged sperm or of an aged ovum.

Experimental animal work has shown that conception involving

**Animal studies**

aged gametes is associated with increased fetal abnormality and wastage. However, this evidence cannot easily be extrapolated to humans. Animals only permit mating when they are in oestrus, and in some species ovulation is triggered by the mating. It is not surprising therefore that experimental manipulation of the time of fertilization is associated with fetal loss. The time for sexual intercourse in humans is not restricted in this way, hence the age of the gametes might not be so crucial. There is no direct evidence that sexual intercourse triggers ovulation in humans.<sup>40</sup>

The problem can only be resolved by human studies, which are difficult to design and execute. Reference is frequently made to the work of Jongbloet,<sup>20</sup> who found a higher incidence of mental defect and Down's syndrome in children of parents practising periodic abstinence. The data were obtained by questioning 127 couples with mentally retarded children around eight years of age about the timing and circumstances of sexual intercourse when the child was conceived. Although an attempt was made to secure a control group, conclusions based on data obtained from recollection of sexual activity more than eight years previously can hardly be considered compelling!

**Human studies**

Microscopic examination of spontaneous abortions has shown chromosomal abnormalities in cases in which there appeared to be a long interval between sexual intercourse and ovulation, but the cases are too few for their statistical significance to be determined.<sup>5</sup> In 11 women with spontaneous abortion, seven had BBT charts with a slow rise,<sup>7</sup> but as four of these had ovulation induced by clomiphene and one was from artificial insemination by a donor, the significance is difficult to evaluate. The percentage of Roman Catholics (who might be expected to be practising periodic abstinence) among the parents of children with Down's syndrome has also been looked at, but was not significantly greater than in a control group.<sup>69</sup> The hypothesis has never been tested that Down's syndrome is more frequent in the offspring of older mothers because sexual intercourse becomes less frequent with age and so the risk of aged gametes being involved is correspondingly greater.<sup>11</sup>

More compelling is the study of Guerrero *et al.*<sup>12</sup> in which the time of sexual intercourse was marked on the BBT chart in 965 cases. The incidence of spontaneous abortion fell as the interval between pre-ovulatory sexual intercourse and the temperature shift lessened, and increased suddenly following sexual intercourse on the third day after the shift. Congenital defects were not reported.

On the other hand, a prospective study of 9,600 pregnancies showed the spontaneous abortion rate to be 5% among the women practising periodic abstinence against 5.3% for the whole group.<sup>42</sup>

A follow-up study of 81 conceptions in which the time of sexual

intercourse and of the temperature shift was known found 63 normal offspring, five with congenital defects, 12 spontaneous abortions, one ectopic pregnancy and three sets of male twins.<sup>32</sup> There was no obvious correlation between the abnormalities and the timing of sexual intercourse, but larger numbers would be required to provide a definitive answer. It would also be necessary to control the other possible causes of congenital defects such as febrile illness during pregnancy, which was shown in a prospective study of 3,216 pregnancies to be important both for abortion and congenital defects.<sup>26</sup> However, in those families where there is already a risk of congenital defects, periodic abstinence could increase the risk. The use of vaginal spermicides in those who are combining periodic abstinence with other methods needs to be considered as well, following a paper by Jick *et al.*<sup>18</sup> suggesting a connection between their use and some congenital defects. A later paper has refuted much of this evidence.<sup>56</sup>

To sum up: while the possibility that periodic abstinence may be associated with a higher incidence of spontaneous abortion and congenital defects in the offspring should be the subject of further study, the present evidence does not suggest that the risk, if any, is appreciable. There is, therefore, no more need to warn prospective users of this hypothetical risk than there would be when prescribing a vaginal spermicide.

## **Advantages and disadvantages**

The advantages and disadvantages of periodic abstinence may be summarized as follows: there are no harmful side-effects for the users as there could be from the use of oral contraceptives or intrauterine devices, and nothing has to be done at the time of sexual intercourse as is the case with barrier and spermicidal methods. On the other hand, periodic abstinence is not as effective in preventing pregnancy as most other methods of contraception.

Increased awareness of normal reproductive physiology can be beneficial as part of general health education and fertility awareness and can help those who are having difficulty in conceiving. Against this, daily monitoring and charting of bodily functions may be found tiresome, inconvenient and even distasteful by some.

Mutual agreement to observe the required periods of abstinence from sexual intercourse can increase communication, co-operation and understanding between the partners. Without this mutual commitment, however, the method will not be successful and disagreement may throw a strain on the relationship. The required sexual abstinence may cause psychological stress in one or both partners,

with resulting marital difficulties. Another disadvantage of periodic abstinence concerns those couples where the man spends a long time away from home (e.g. migrant workers, members of the armed forces). His reappearance may coincide with the fertile phase of the cycle, and abstinence is unlikely to be acceptable to either partner at such a time.

Prospective users can be taught and supervised by selected and trained lay volunteers, making small demands at that stage upon health-care personnel and services, though the training of lay volunteers can be costly in terms of the time taken by those who train them. Perhaps the best trainers and educators are those women who themselves have kept temperature charts and/or successfully used the cervical mucus method, though it is unlikely they can be incorporated in sufficient numbers in any large-scale government programme. The cost of thermometers and charts is not great. Though users should achieve independence, the need for extended supervision during the training period and during difficult times such as lactation and the approach of the menopause requires considerable organization. In the WHO study of the cervical mucus method it was found that three cycles of training were needed plus monthly follow-up for many months.

Finally, periodic abstinence offers a means of family planning to those who have ethical or religious objections to other methods.

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## *Use in developing countries*

Experience of use in developing countries has been varied.<sup>47</sup> Extensive promotion in Colombia met with a low acceptance rate which was attributed to lack of conviction among doctors of the effectiveness of periodic abstinence, unwillingness of couples to change their pattern of sexual behaviour, and the need for acceptance by both partners.<sup>37</sup> The fact that promotion was part of a study involving acceptance of the discipline of long-term follow-up and reporting of sexual behaviour may also have influenced the outcome.

**Use in  
Colombia**

However, more limited promotion by specialized agencies in Calcutta and Mauritius has found acceptance and continued use, including use by non-literate couples.<sup>14,35</sup>

A paper delivered in March 1982 by Dr Enrique Carrasco of the World Fertility Survey<sup>6</sup> at the UNFPA/WHO symposium in New York on periodic abstinence gives tables of ever-use and current use of various contraceptive methods in 26 developing countries (Tables III and IV). From these tables it can be seen that, overall, the use of methods requiring abstinence is less common than other contraceptive methods, although the total percentage of women using any method is, with few exceptions, below 40%. Thus it appears that there are many factors in developing country populations which do not favour the use of periodic abstinence methods. Where they are used, this is mainly for spacing births, and many couples change to other forms of contraception, such as oral contraceptives or intrauterine devices, when they decide to limit the size of their family.

**Periodic  
abstinence  
not  
common in  
developing  
countries**

A factor influencing acceptance is the cultural attitude to sex, which may make discussion between partners or personal observation of signs of ovulation difficult or even unacceptable. This would necessitate a programme of general sex education before acceptance could be expected. This is part of training in some periodic abstinence programmes. Those wishing to use the method might nevertheless be hampered by living conditions which make temperature taking or even observing and recording changes in cervical mucus, or storing charts,

**Difficulties  
of living  
conditions**

**Table III** Percentage of Ever-married Women who Ever Used Contraceptive and Individual 'Natural' Methods

Source: Adapted from Carrasco, E.<sup>6</sup>

Region and country	Any method	Individual 'natural' methods						
		Modern*		Rhythm**	Abstinence†	Withdrawal	Douche	Other
		Any	Pill					
<b>AFRICA</b>								
Kenya	32	13	8.4	13.8	13.6	5.1	1.4	0.2
Senegal	11	1	0.7	1.2	8.2 <sup>1</sup>	—	0.4	1.1
Sudan	15	12	11.6	3.8	1.1	1.2	0.5	1.7
<b>ASIA</b>								
Bangladesh	14	10	5.2	4.6	2.4	2.7	2.1	0.7
Fiji	68	57	30.5	15.5	9.7	15.2	—	7.5
Indonesia	34	30	23.2	2.7	3.5	1.9	0.4	3.4
Korea, Republic of	57	52	33.4	16.1	2.3	11.8	4.0	0.3
Malaysia	48	38	31.9	10.4	4.3	7.9	—	2.9
Philippines	58	40	24.7	23.1	10.2	31.0	2.2	1.0
Sri Lanka	43	20	8.2	21.6	11.9	6.3	1.5	0.3
Thailand	46	39	25.8	7.0	6.8	5.3	2.5	0.4
<b>MIDDLE EAST</b>								
Jordan	46	39	35.7	12.9	3.7	18.5	2.4	10.1
Syria	33	29	26.6	11.4	0.8	9.0	3.7	1.3
Turkey	55	34	24.6	4.6	1.0	32.0	18.6	8.0
<b>LATIN AMERICA and CARIBBEAN</b>								
Colombia	59	47	32.6	18.2	5.8	16.9	5.2	3.7
Costa Rica <sup>2</sup>	82	73	50.8	20.3	4.0	25.6	5.1	1.8
Dominican Republic	48	37	19.7	7.2	—	18.8	3.3	7.4
Guyana	53	44	20.7	11.0	7.9	14.0	4.3	2.8
Haiti	36	12	7.2	15.5	8.9	19.8	7.6	0.9 <sup>3</sup>
Jamaica	66	56	29.7	4.8	11.0	20.1	3.9	2.6
Mexico	45	35	25.7	12.8	—	17.6	4.5	0.6
Panama <sup>2</sup>	73	63	42.6	16.0	7.8	18.1	10.5	1.9
Paraguay	55	41	30.3	12.0	—	10.1	8.7	11.3
Peru	49	23	13.4	26.6	7.2	16.5	14.8	2.8
Trinidad & Tobago	78	72	46.7	14.5	7.0	29.8	9.4	2.2
Venezuela <sup>3</sup>	66	56	38.3	14.2	—	20.6	13.1	1.2

<sup>1</sup>Includes withdrawal

<sup>2</sup>Women aged 20-49 only

<sup>3</sup>Women aged 15-44 only

\*Includes oral contraceptives, IUDs, injectables, condoms, diaphragms, spermicides and sterilization.

\*\*Includes calendar, BBT, cervical mucus and symptothermal methods.

†This refers to postpartum abstinence in various cultures usually associated with lactation.

**Table IV** Percentage of Women in Union Currently Using ContraceptionSource: Adapted from Carrasco, E.<sup>9</sup>

Region and country	All methods	Individual 'natural' methods							
		Modern*		Total 'natural' methods	Rhythm**	Withdrawal	Abstinence†	Douche	Other
		Any	Pill						
<b>AFRICA</b>									
Kenya	7	4	2.0	3	1.1	0.2	1.1	0.0	0.1
Senegal	4	1	0.3	3	0.4	—	2.5 <sup>1</sup>	0.0	0.3
Sudan	6	5	4.3	1	0.5	0.1	0.1	0.0	0.0
<b>ASIA</b>									
Bangladesh	8	5	2.9	3	1.1	0.5	1.2	0.1	0.2
Fiji	41	35	8.2	6	2.3	2.8	0.3	—	0.4
Indonesia	26	23	14.9	3	0.8	0.3	1.0	0.1	1.2
Korea, Republic of	35	27	8.4	8	4.6	2.6	0.4	0.3	0.0
Malaysia	33	24	16.2	9	3.5	1.9	1.7	—	2.2
Philippines	36	16	1.4	20	8.5	9.4	1.8	0.2	0.1
Sri Lanka	32	19	1.5	13	8.0	1.5	3.5	0.0	0.1
Thailand	33	30	13.7	3	0.9	0.9	0.7	0.1	0.3
<b>MIDDLE EAST</b>									
Jordan	25	17	11.9	8	2.1	3.3	0.4	0.0	2.0
Syria	20	15	11.8	5	2.8	1.6	0.0	—	0.2
Turkey	38	13	6.1	25	1.0	16.7	0.0	4.3	2.5
<b>LATIN AMERICA and CARIBBEAN</b>									
Colombia	43	31	13.3	12	5.1	4.7	0.9	0.5	0.8
Costa Rica <sup>2</sup>	64	53	22.5	11	5.1	4.6	0.5	0.3	0.4
Dominican Republic	32	26	7.9	6	1.2	3.7	—	0.6	0.3
Guyana	32	25	9.0	7	2.9	1.0	1.2	1.9	0.4
Haiti	19	5	3.3	14	4.2	4.7	4.0	0.5	0.1
Jamaica	39	37	11.9	2	0.3	1.4	0.4	0.0	0.0
Mexico	30	23	10.8	7	3.1	3.6	—	0.2	0.2
Panama <sup>2</sup>	54	46	17.0	8	2.5	3.0	1.4	0.7	0.4
Paraguay	36	23	11.9	13	4.2	2.4	—	2.0	4.4
Peru	31	11	4.2	20	10.9	3.3	2.1	3.3	0.6
Trinidad & Tobago	52	46	18.0	6	2.3	2.8	0.3	0.3	0.2
Venezuela <sup>3</sup>	49	38	15.3	11	4.0	4.7	—	2.3	0.5

<sup>1</sup>Includes withdrawal<sup>2</sup>Women aged 20-49 only<sup>3</sup>Women aged 15-44 only

\*Includes oral contraceptives, IUDs, injectables, condoms, diaphragms, spermicides and sterilization.

\*\*Includes calendar, BBT, cervical mucus and symptothermal methods.

†This refers to postpartum abstinence in various cultures usually associated with lactation.

difficult. There may be no place to keep a thermometer; the woman may not get up at the same time each morning, and she may be unable to learn to read a thermometer or keep or interpret a temperature chart. Also, in very poor families even the small costs involved may be too much to pay out. Persistent ill-health may also make both temperature and mucus findings difficult to interpret.

## Problems for programme administrators

Present evidence indicates that the sympto-thermal method is more effective than the cervical mucus method. It is, however, more cumbersome. The decision whether to promote one or the other or both must, however, also take into account the living conditions of the prospective users, and whether they can obtain and use a thermometer. There is, however, no justification nowadays for mounting a programme to promote the calendar method alone. This would require a considerable educational effort disproportionate to the low effectiveness of this method on its own.

### Requirements for programmes

Thermometers and charts are relatively cheap as compared with barrier and chemical contraceptives. The main requirements and costs of a programme to promote periodic abstinence as a method of family planning are to select and train teachers who will both instruct and give follow-up support to potential users. To date these costs have been relatively small as volunteers are used in many periodic abstinence programmes, and most governments have not yet supported such programmes.

However, a study in the Philippines in 1976<sup>46</sup> looked at the costs of periodic abstinence methods, mainly the calendar rhythm method, and compared these with the costs of other forms of contraception in the Philippine Family Planning Program (Table V). Costs for beginning and continuing users were about the same for periodic abstinence as for oral contraceptives, IUDs and condoms, while costs per birth averted were very much higher for periodic abstinence.

In general, government programmes in developing countries are likely to be expensive. The time needed to be devoted to instructing and providing follow-up to users with a low level of education would make such programmes costly, especially considering the low use-effectiveness of the method.<sup>73,74</sup> Training instructors can be lengthy and costly and follow-up of couples trained in the methods may be needed over many months.

Diverting limited resources to promoting a method demanded by only a small minority may require considerable justification. This justification may be found in the fact that the number of users would

**Table V** Average Annual Cost per Acceptors – Beginning and Continuing and per Births Averted, by Method  
Philippines Family Planning Program

Source: Pernia, E. N. & Danao, R. A.<sup>46</sup>

<b>Method</b>	Cost per beginning acceptor (US \$)	Cost per continuing acceptor (US \$)	Cost per birth averted (US \$)
Periodic abstinence	<b>11.68</b>	<b>10.42</b>	<b>52.78</b>
Intrauterine devices	<b>11.95</b>	<b>9.49</b>	<b>37.35</b>
Condoms	<b>12.17</b>	<b>11.62</b>	<b>49.31</b>
Oral contraceptives	<b>12.74</b>	<b>11.57</b>	<b>38.13</b>
Sterilization	<b>20.34</b>	—	<b>7.38</b>

be larger if reliable information were more widely available. The development of periodic abstinence has to a great extent been hampered by misinformation. Couples who rely primarily on barrier methods often combine this with unprotected sexual intercourse during phases of the cycle they erroneously think may be infertile. This is further justification for disseminating reliable information and providing proper instruction. Such information should help to promote the more effective use of barrier methods (see page 37) by limiting them to the fertile phase of the cycle.

**Reliable  
information  
needed**

When periodic abstinence becomes one of the options offered in a family planning programme, whether by volunteers or government agencies, it is important that couples or individuals are counselled about all forms of contraception and are told about the advantages and disadvantages of all methods. They must then be allowed to make their own informed choice of which method they prefer.

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# *Appendix*

## *IPPF Policy on periodic abstinence approved by the IPPF Central Council in November 1982\**

Results of recent, properly conducted trials show conclusively that periodic abstinence (sometimes inaccurately referred to as 'natural family planning') is much less effective than other available family planning methods. This method depends on identifying the fertile phase of the menstrual cycle which occurs around the time of ovulation. In order to avoid pregnancy, abstinence from sexual intercourse during the fertile phase has to be observed. Owing to the difficulty of accurately predicting the fertile phase, abstinence sometimes has to be observed for a large part of the menstrual cycle. Present techniques, which include the calendar method, basal body temperature method, cervical mucus method or a combination of these, such as the sympto-thermal method, may be used for identifying the time of ovulation and deducing from it the fertile phase.

Although theoretical calculations may suggest that these techniques can be relatively effective, in practice the failure rates are high. In recent major studies, almost 20% of women using the sympto-thermal method became pregnant within a year, as did about 25% of those using the cervical mucus method, compared with less than 5% of those using oral contraceptives or intrauterine devices. While the sympto-thermal method appears to be more effective than the cervical mucus method, the two methods show wide and overlapping ranges of pregnancy and discontinuation rates among different groups of women. Failure and discontinuation rates at this level are unusually high as compared with other methods. IPPF therefore does not advise that periodic abstinence be considered as an equal alternative to other more effective family planning methods.

Nevertheless, periodic abstinence can be the only choice for individuals and couples who cannot or do not want to use other methods of fertility regulation for a variety of reasons. Family planning associations should therefore familiarize themselves with the techniques and be prepared to teach them if a demand can be demonstrated. Couples electing to use periodic abstinence should, however,

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\*This statement is valid for the currently available methods for identifying the fertile phase of the menstrual cycle. IPPF reserves the right to amend the statement in the light of further developments in this field.

be clearly informed that the method is not considered an effective method of family planning.

It should be recognized that periodic abstinence as a method is better than no method at all. There are also various benefits to be obtained from an understanding of the reproductive cycle. It provides an opportunity for women to learn about their physiology. The identification of the fertile phase is the basis for one contraceptive practice whereby couples choose to use barrier methods only during those days estimated to be the fertile phase of the woman's cycle. It may also be a starting point for the use of more effective contraception. Finally, methods for the detection of ovulation have been used and continue to be valuable in the diagnosis and, more importantly, in the treatment, of infertility.