



World Organisation of Ovulation Method Billings

# The Scientific Facts of the Billings Ovulation Method®

Marian Corkill  
Director WOOMB International Ltd

Costa Rica - 2018



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# What do

- 2 Catholics,
- 1 Presbyterian and
- 1 Lutheran

# have in common?



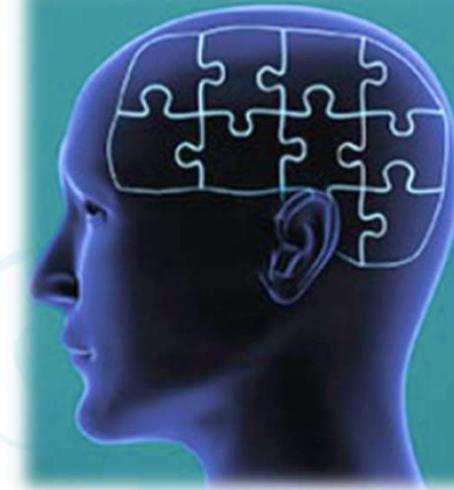
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# All were given great gifts

- Scientific Minds
- Compassion
- Humility
- Faith

# Scientific Mind

*is the mind which questions everything around it and within it. It seeks answers, reasons and explanations ranging from what exists at the edge of our universe to the reason behind why we even exist.*



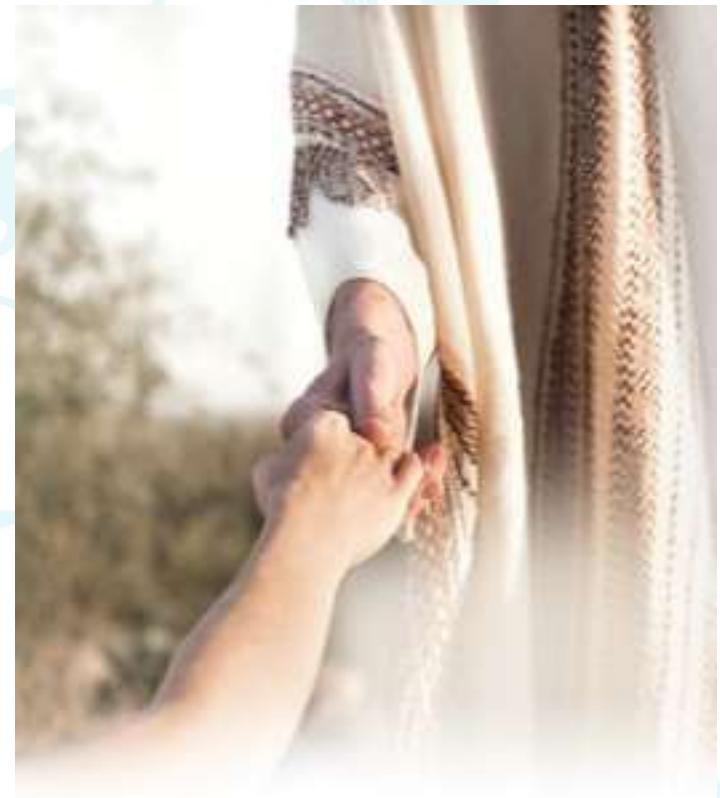
The scientific mind does not so much provide the right answers as ask the right questions.

Claude Lévi-Strauss



# Compassion

*can be defined as behaviour that aims to nurture, look after, teach, guide, mentor, soothe, protect, offer feelings of acceptance and belonging in order to benefit another person.*



# Humility

*The state or quality of being humble.  
Having or showing a consciousness  
of one's defects or short comings;  
not proud; not self  
assertive; modest.*

I BELIEVE THE  
FIRST TEST OF  
A TRULY GREAT  
MAN IS IN HIS  
HUMILITY.

*John Ruskin*

# Faith

*Complete trust or confidence in someone or something.*

*Strong belief in the doctrines of a religion, based on spiritual conviction rather than proof.*

*A strongly held belief.*





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Have you worked out  
who I am talking about?



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Drs John and  
Evelyn Billings



Professor  
James Brown



Professor  
Erik Odeblad



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All four played an integral part  
in the compiling of the  
**Scientific Facts of the Billings  
Ovulation Method®**, with John  
Billings as the linchpin

## John James Billings

Born – 5<sup>th</sup> March, 1918

Dux - Xavier College, 1935

Lyn and John met, 1938

Graduated Medical School 1941

Lyn and John married, 1943

Responded to Fr Catarinich's request, 1953

## Evelyn Livingston Thomas

Born – 8<sup>th</sup> February, 1918

Dux - St Michael's Grammar,  
1936

Graduated Medical School 1942



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# Scientific Facts of the Billings Ovulation Method®



1953 Fr Maurice Catarinich, Director of Marriage Guidance, Melbourne sought the assistance of a doctor willing to find a more effective natural family planning method to help couples space their children

Dr John Billings agreed to help – offering to assist for three months – now known as

*“Longest 3 months in history”.*

## Beginnings of quest for answers

Dr John Billings' search of the literature revealed:

- references to cervical discharge

- 1865 J.M. Sims
  - 1885 W.T. Smith

- references to basal body temperature changes

- 1868 drop in temperature prior to menses
  - 1905 Van de Velde noticed a drop in middle of cycle followed by a rise until just before menstruation (one patient)

## Beginnings of quest for answers

Dr John Billings' search of the literature revealed:

- 1920s Independent discoveries of Ogino (Japan) and Knaus (Austria) that identified ovulation occurs 2 weeks before menstruation.  
Basis of the Rhythm Method.
- 1932 book by Leo Latz "*The Rhythm of Sterility and Fertility in Women*" based on findings of Ogino and Knaus

## Beginnings of quest for answers

- Findings of Ogino and Knaus had been utilised to develop the Rhythm Method
- Samples of cervical mucus had been studied in the laboratory - no further research
- Discharge was mentioned in gynaecology texts books but was described as: “a benign phenomenon which was of no great consequence.”

## Beginnings of clinical research

In counselling women seeking help Dr Billings asked them:

- to follow the guidelines of the Rhythm Method
- to keep a daily record of discharge and avoid these days for intercourse, if not wishing to conceive
- to keep a separate record of daily temperature readings

## Beginnings of clinical research

John Billings and Fr Catarinich pored over charts and temperature records to unlock the key to the mucus message

### Findings:

- relationship between cervical mucus discharge and fertility identified
- significance of slippery sensation identified

**Rules of Ovulation Method developed**  
***emphasis on ovulation rather than menstruation***

# Preliminary Data

## Couples wishing to avoid pregnancy

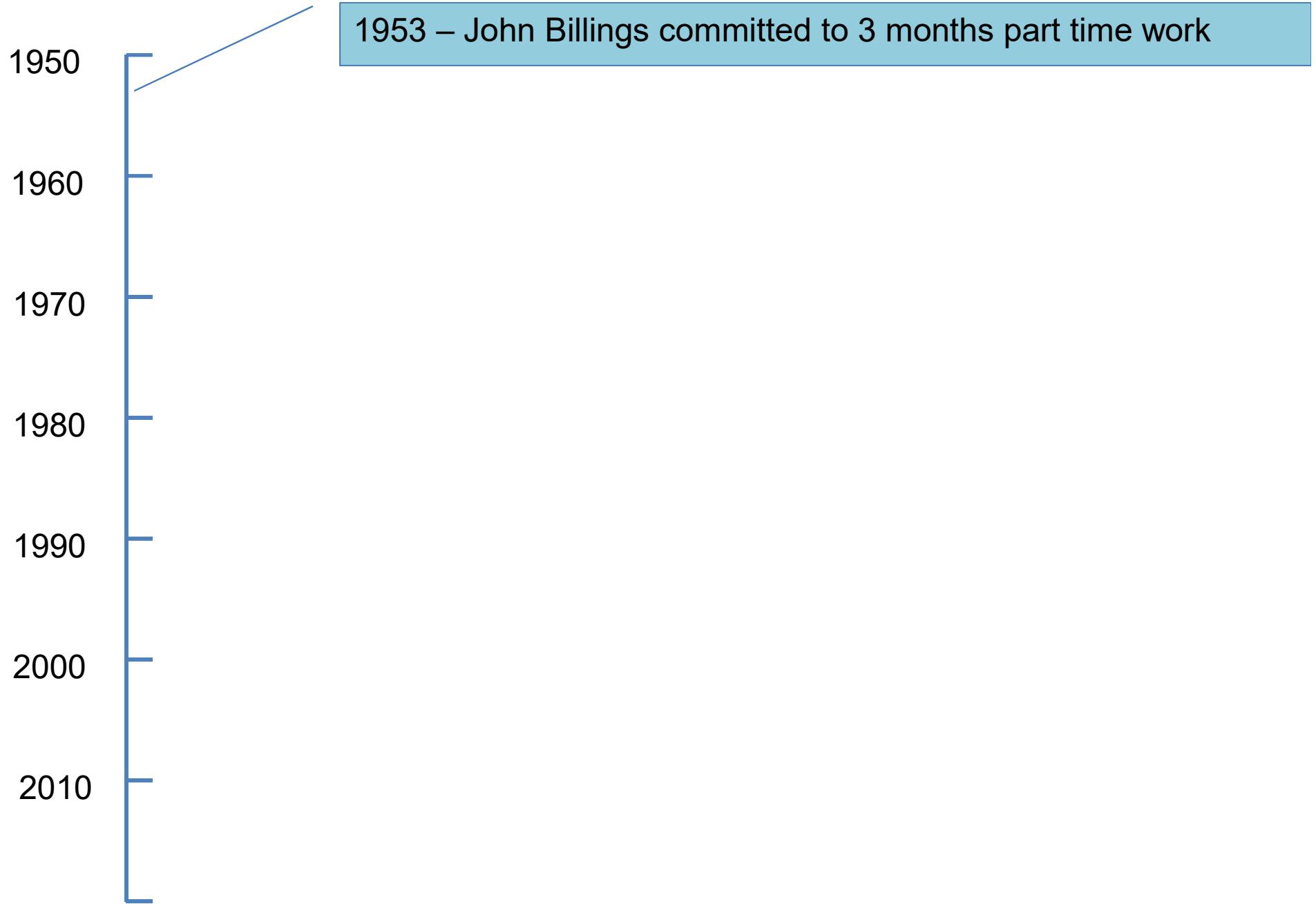
- No conceptions when days of discharge were avoided
- No pregnancies from intercourse 4 days after last slippery sensation

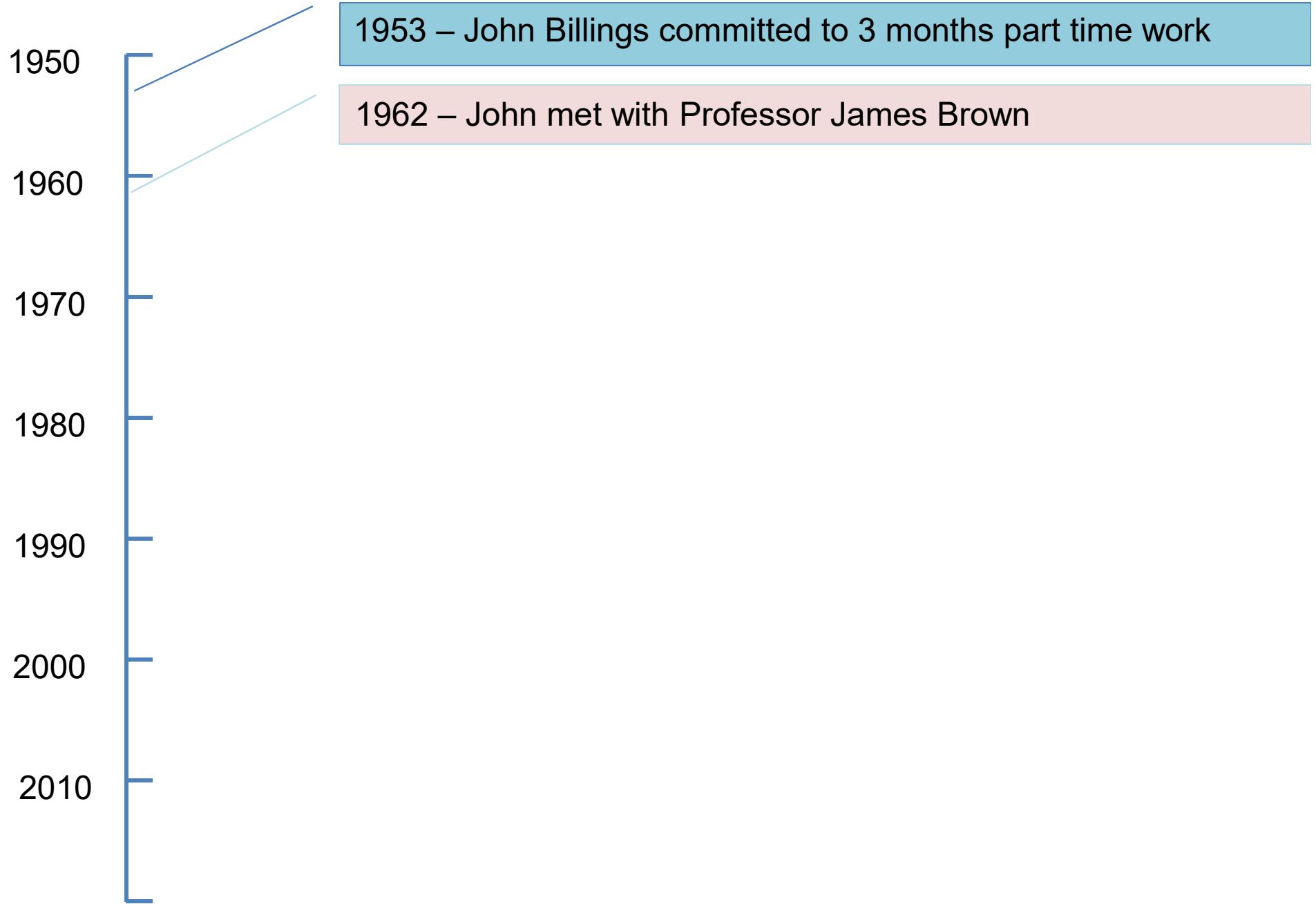
## Couples wishing to achieve a pregnancy

- Many conceived when acts of intercourse occurred when mucus was present
- One pregnancy on day 3 past Peak, a few on day 2 past Peak, more on day 1 past Peak but most pregnancies occurred after intercourse on Peak Day

## Conclusions

- mucus must be present for sperm survival
- Peak- last day of slippery sensation. Mucus quantity irrelevant
- temperature rise was non-specific – subject to other influences





## Further Breakthroughs

- 1962 Professor James B Brown arrived in Melbourne to set up the Endocrine Unit at the Royal Women's Hospital for the University of Melbourne.
- Dr Billings asked Prof Brown to confirm the clinical results through laboratory hormone assays.
- Prof Brown agreed stating he had hoped his laboratory techniques could be used to assist the development of a natural method!

# **Professor Emeritus James Boyer Brown**

## **MSc (NZ) PhD (Edin) DSc (Edin) FRACOG**

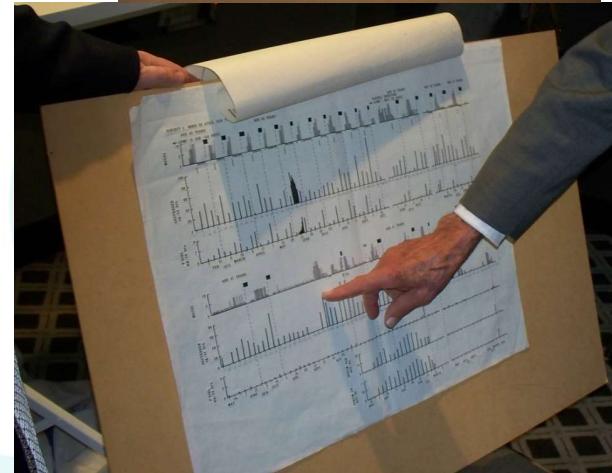
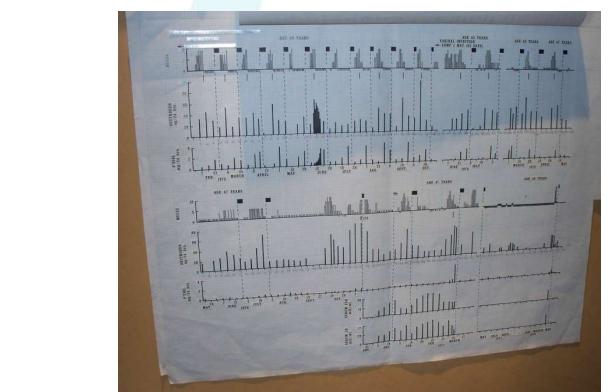
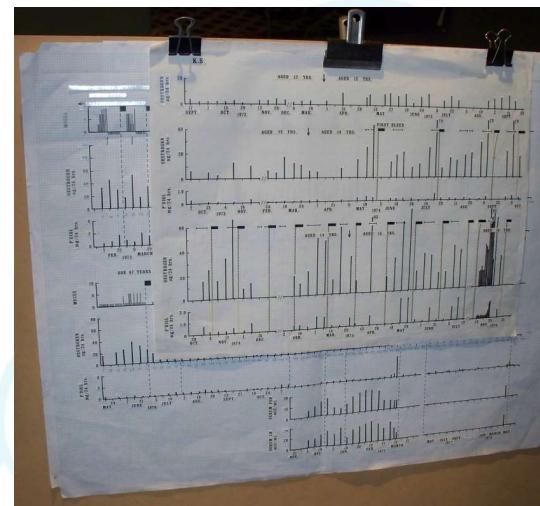
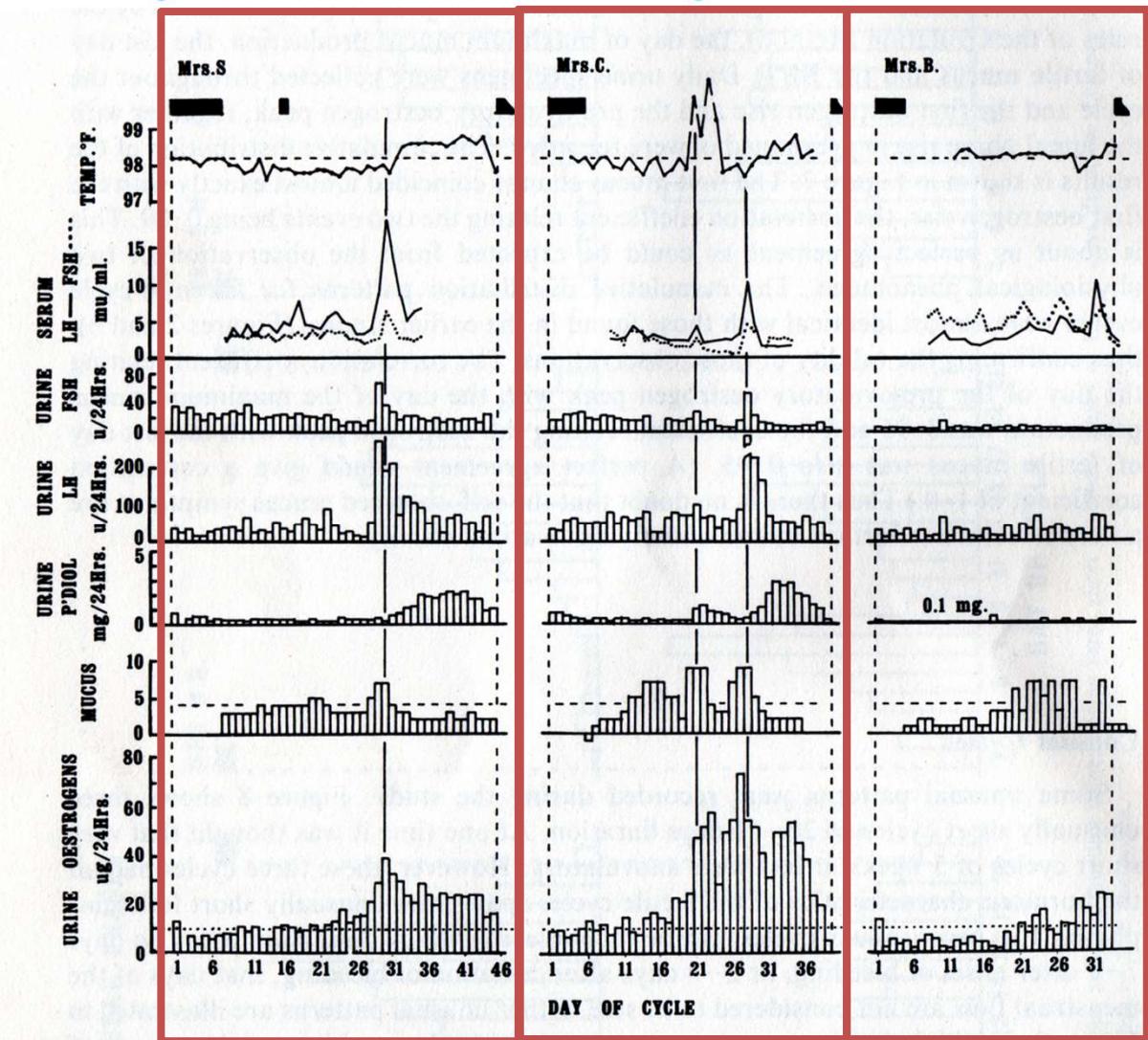
- Developed a method for the measurement of oestrogen in urine (awarded a full Citation Classic)
- First to publish the pattern of oestrogen production throughout the menstrual cycle
- Collaborated with Klopper developing a method for measuring urinary pregnanediol in non pregnant women (awarded a half Citation Classic)
- With colleagues developed a method for the measurement of luteinising hormone (LH) in urine
- With colleagues in Edinburgh, purified Human Pituitary Gonadotrophin and then developed methods for their safe use. This work led to his understanding of follicle stimulating hormone (FSH) in the menstrual cycle.

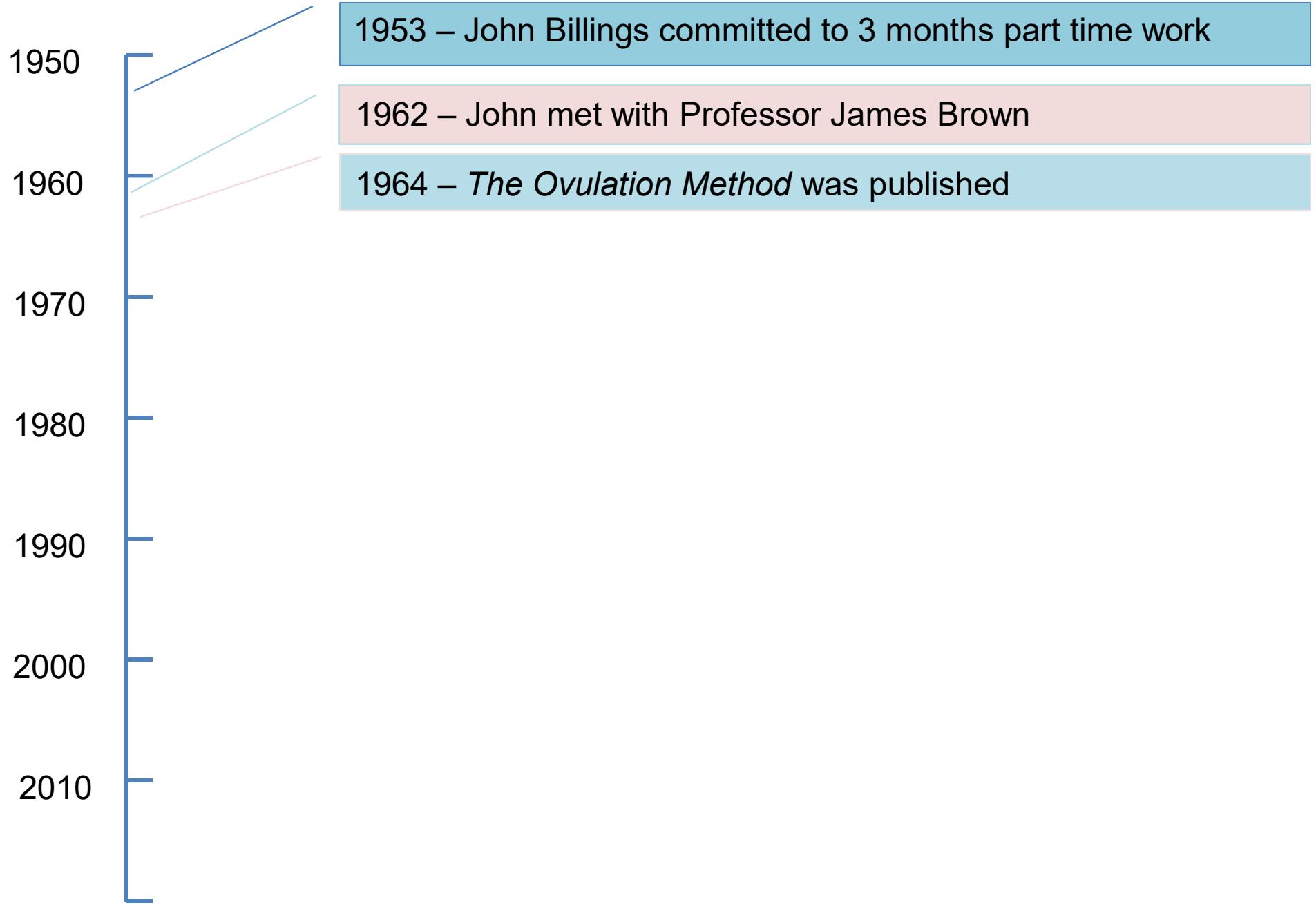
# Hormones of the Normal Menstrual Cycle

- Cyclical changes in ovarian activity are controlled by the pituitary hormones – follicle stimulating hormone (FSH) and luteinizing hormone (LH)
- Production of these hormones is controlled by the hypothalamus
- The ovulatory mechanism produces the ovarian hormones – oestradiol and progesterone
- The one event in the cycle with a very precise time frame is ovulation



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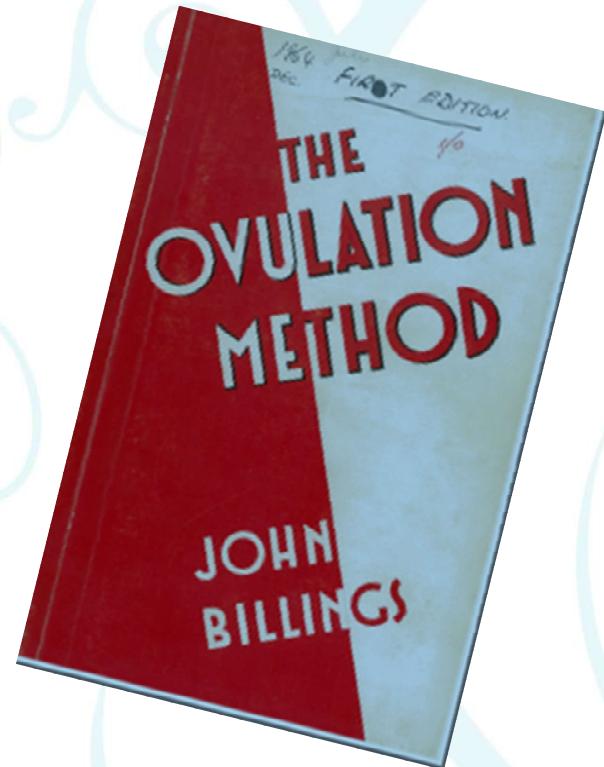


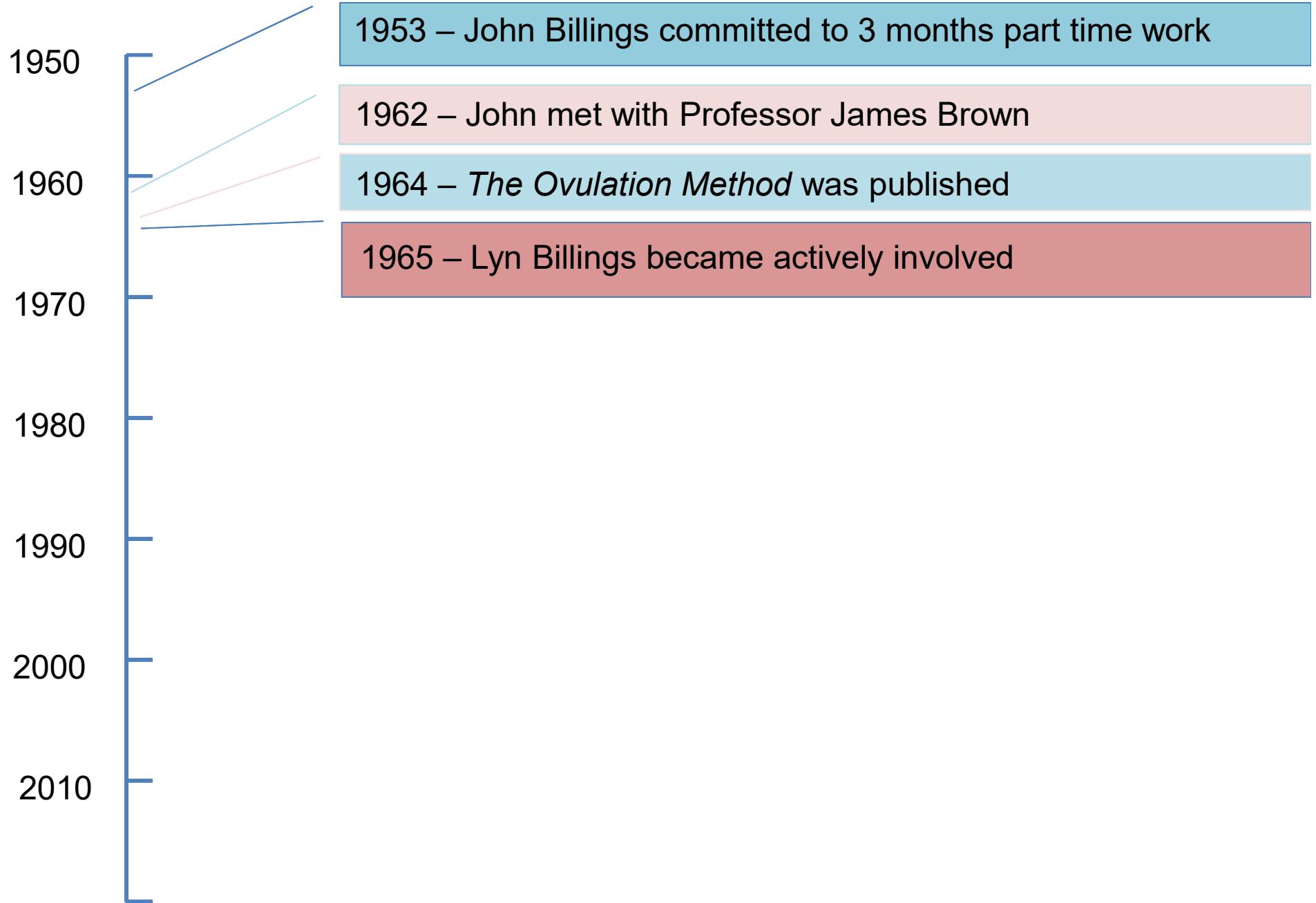
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## Further Breakthroughs

Dr Evelyn Billings read manuscript of “*The Ovulation Method*” and was immediately interested.

In 1965 she joined team with John Billings and Fr Cataranich.

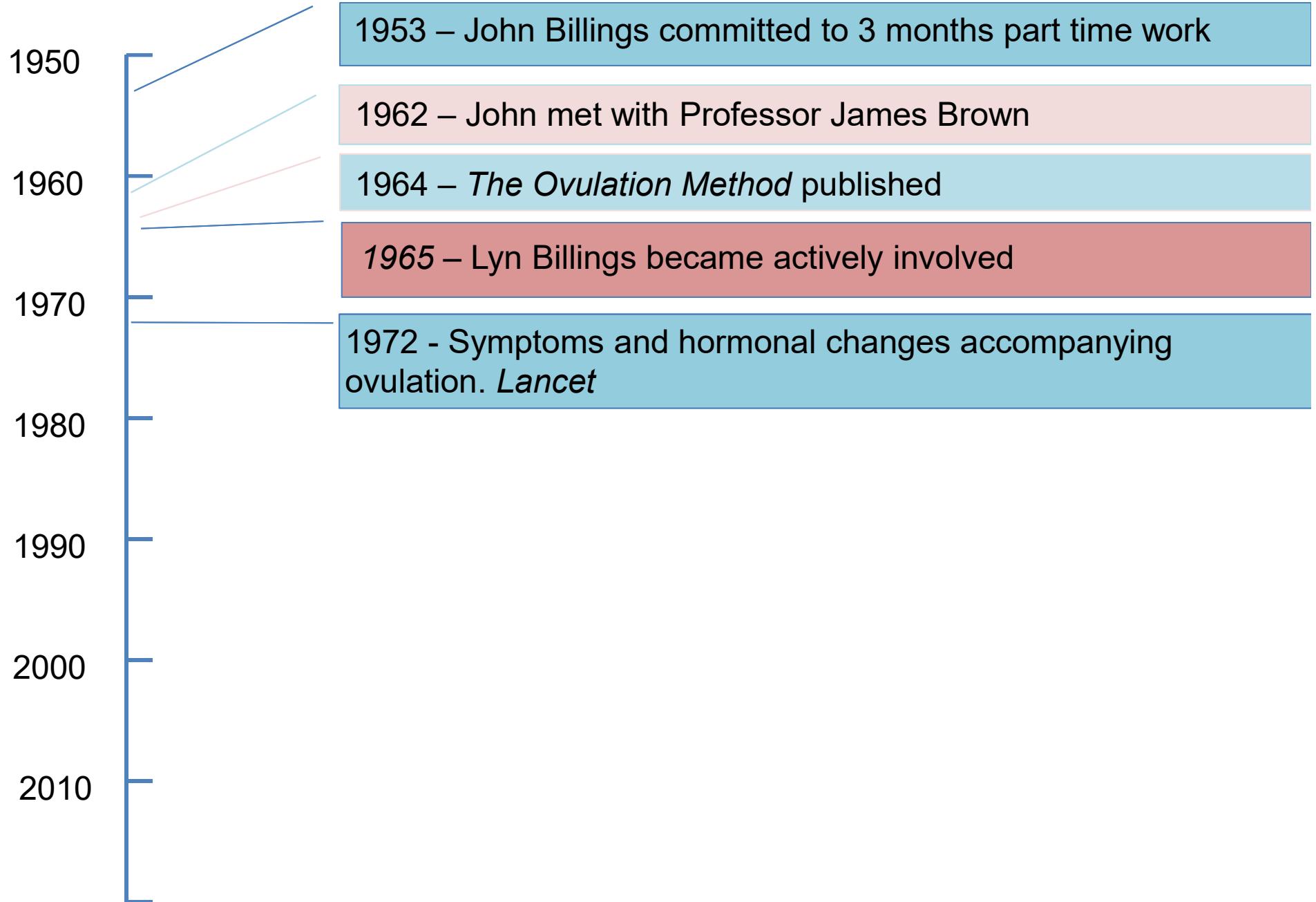




# Dr Evelyn Livingston Billings

AM, DCSG, MBBS, DCH (Lond)

- Worked with the “hard cases” and recognised that the women’s charts were reflecting patterns of fertility and also patterns of infertility
- In collaboration with Professor Brown
  - Identified the Basic Infertile Pattern of discharge
  - Identified the combined Basic Infertile Pattern in long cycles
- Showed the importance of the presence of mucus for a cycle to be fertile, as seen in the menopausal studies





## SYMPTOMS AND HORMONAL CHANGES ACCOMPANYING OVULATION

E.L. Billings, J.B. Brown, J.J. Billings, H.G. Burger

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[https://doi.org/10.1016/S0140-6736\(72\)90291-7](https://doi.org/10.1016/S0140-6736(72)90291-7)

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### Abstract

To determine whether normal women could predict and identify symptomatically the occurrence of ovulation, twenty-two volunteers were instructed in a pattern of vaginal "mucus symptoms" which had been established previously. Plasma luteinising hormone and urinary oestrogens and pregnanediol were measured to provide a "hormonal estimate" of the day of ovulation. A characteristic "lubricative" mucus identified by all the women occurred on the day of ovulation in five, 1 day before in nine, and 2 days before in four. The onset of mucus symptoms occurred 6·2 days (mean) before ovulation. It is concluded that the time of ovulation can be identified clinically, without recourse to temperature measurement or more specialised tests.

Published February, 1972

**EL Billings, JB Brown, JJ Billings, HG Burger**  
Mucus symptoms, blood LH, urinary oestrogens and urinary pregnanediol were assessed in 22 volunteers.

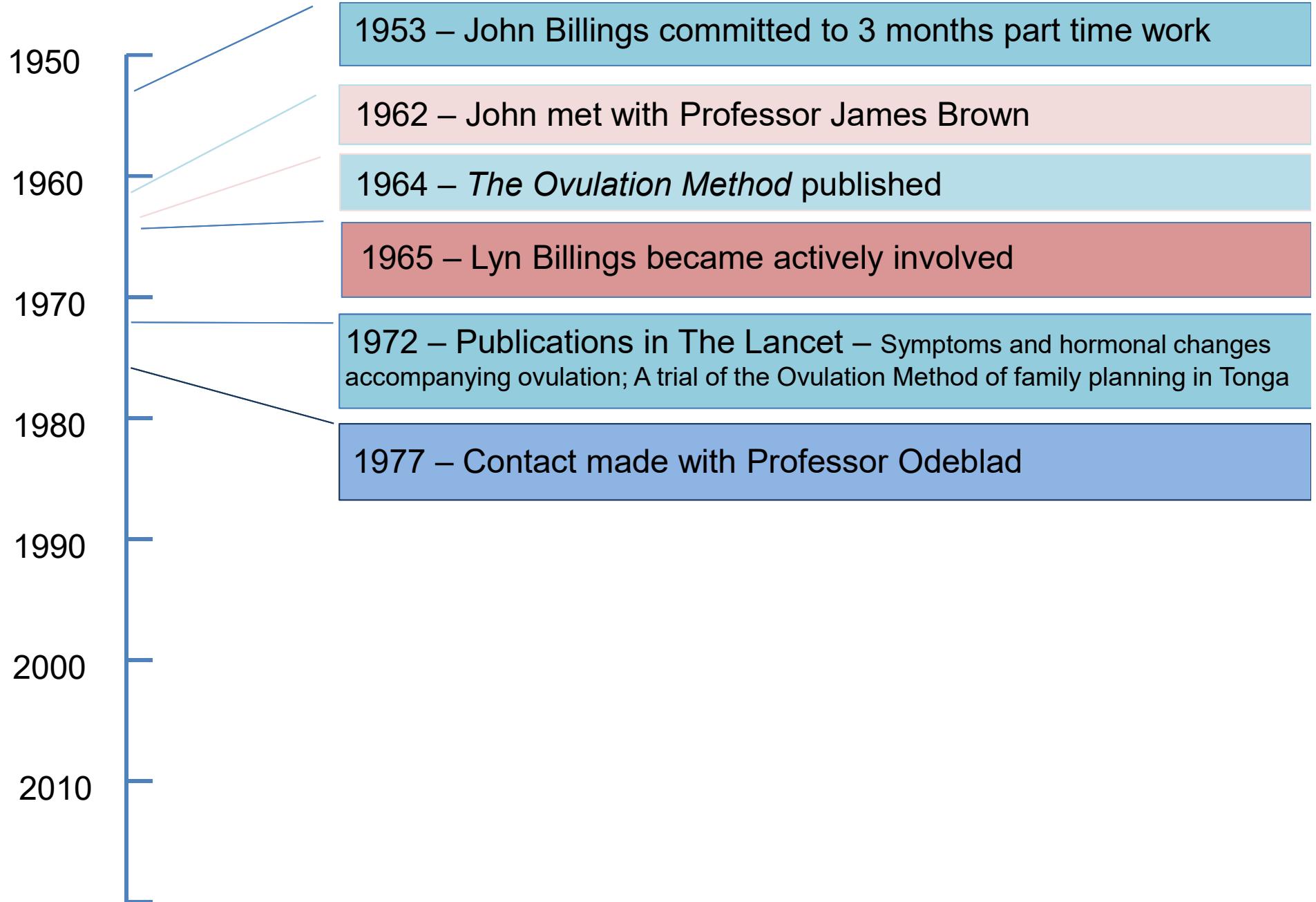
**"It is concluded that the time of ovulation can be identified clinically, without recourse to temperature measurement or more specialised tests."**

The screenshot shows the header of The Lancet website with navigation links like Online First, Current Issue, All Issues, Special Issues, Multimedia, and Information for Authors. Below the header, it displays the article details: Volume 300, No. 7781, p813-816, 14 October 1972. The title of the article is "A TRIAL OF THE OVULATION METHOD OF FAMILY PLANNING IN TONGA". The authors listed are Sister M.Cosmas Weissmann, Leopino Foliaki, EvelynL. Billings, JohnJ. Billings. The publication date is 14 October 1972. There is a PlumX Metrics link and a DOI link ([https://doi.org/10.1016/S0140-6736\(72\)92164-2](https://doi.org/10.1016/S0140-6736(72)92164-2)). The abstract section starts with a brief introduction about the ovulation method and its clinical studies, followed by a summary of the trial's results in Tonga.

Published October, 1972

**Sr Cosmas Weissmann, Leopino Foliaki, EL Billings, JJ Billings**

**282 participants with a total of 2503 months of charting  
1 Method related pregnancy -  
2 User related pregnancies**





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## Further Breakthroughs

Early 1970s Drs Billings learned of the work of Professor Erik Odeblad

In 1976 they were given a book produced by the WHO containing an article written by Erik Odeblad about two types of cervical secretion – estrogenic (E) mucus and gestogenic (G) mucus

Dr Kevin Hume met with Professor Odeblad in Sydney in 1977 and presented him with the published resource material on the Ovulation Method

# **Emeritus Professor Erik Odeblad**

**MD(Gynae), PhD (Physics)**

- Resident in Obstetrics and Gynaecology,  
Karolinska Institute
- Associate Professor at Karolinska Institute
- Rockefeller Foundation Fellow, University of  
California, Berkeley
- Research Fellow of Swedish Medical Research  
Council
- Professor Emeritus of the Department of Medical  
Biophysics, University of Umeå, Sweden

# **Emeritus Professor Erik Odeblad**

**MD(Gynae), PhD (Physics)**

- Rockefeller Foundation Fellow, University of Carolina.  
Here he met Professor Bloch, Nobel Laureate in Physics  
for his Studies on Activation Analysis and Nuclear  
Magnetic Resonance (NMR)
- Returned to Sweden and modified the spectrometer  
built by Dr Gunnar Lindström. He then used it for his  
pioneering biomedical NMR applications  
1955 Odeblad and Lindström published their first NMR  
results on biological samples
- 2012 - Awarded the European Magnetic Resonance  
Award

# Emeritus Professor Erik Odeblad

MD(Gynae), PhD (Physics)

Significance of his use of NMR to analyze mucus in single crypts without contamination of other crypts.

- Proved the existence of different types of cervical crypts and cervical mucus
  - 1966 – preliminary studies showed two types – E and G
  - 1977 – three different types – G, L and S
  - 1990 – P mucus
  - 1993 – F mucus
- Discovered reabsorption qualities of Pockets of Shaw under influence of progesterone

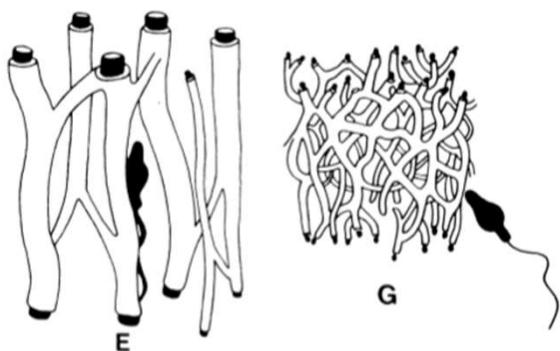
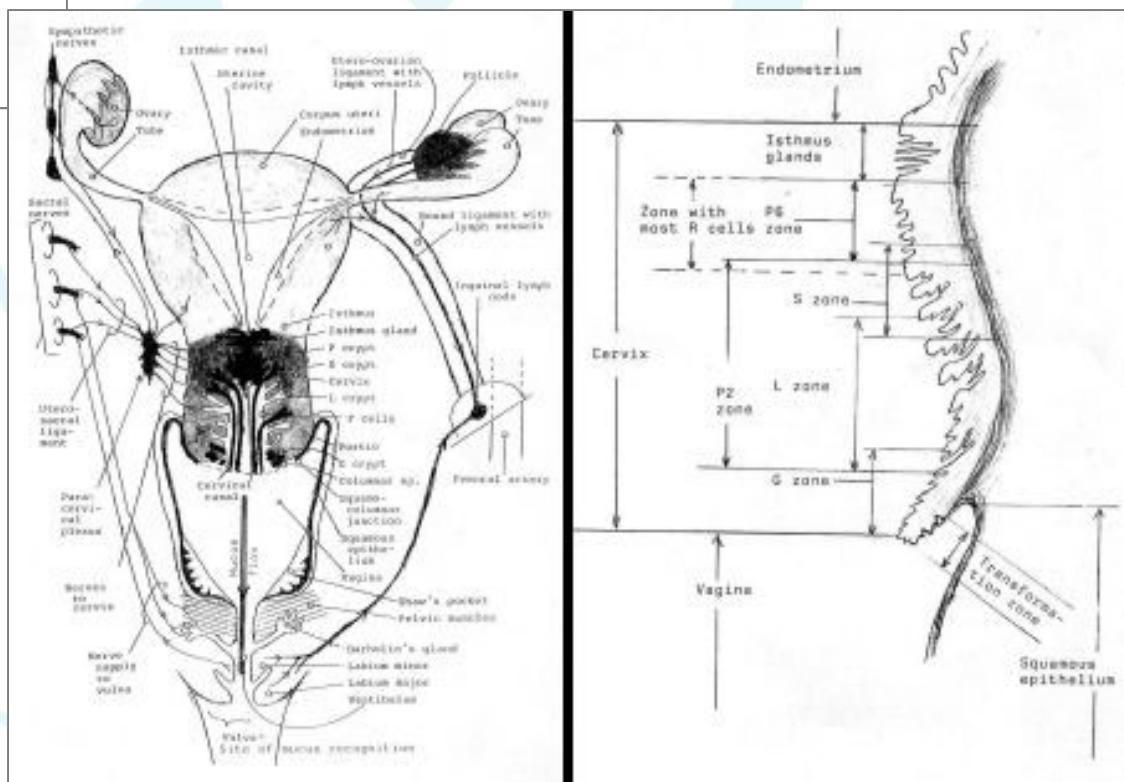
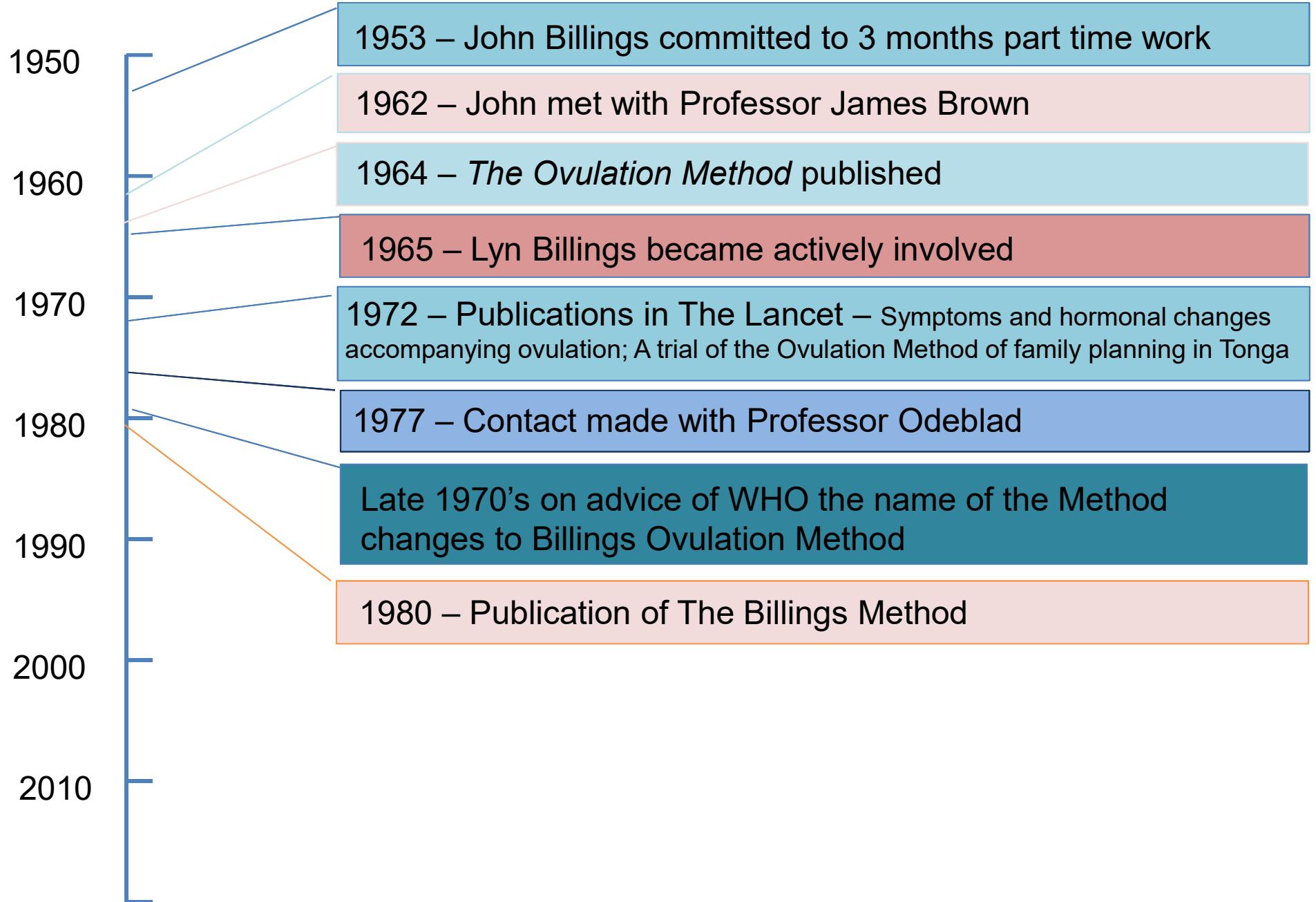


Figure 1. Schematic Three-Dimensional View of the Structure of Mucus type E and Type G.

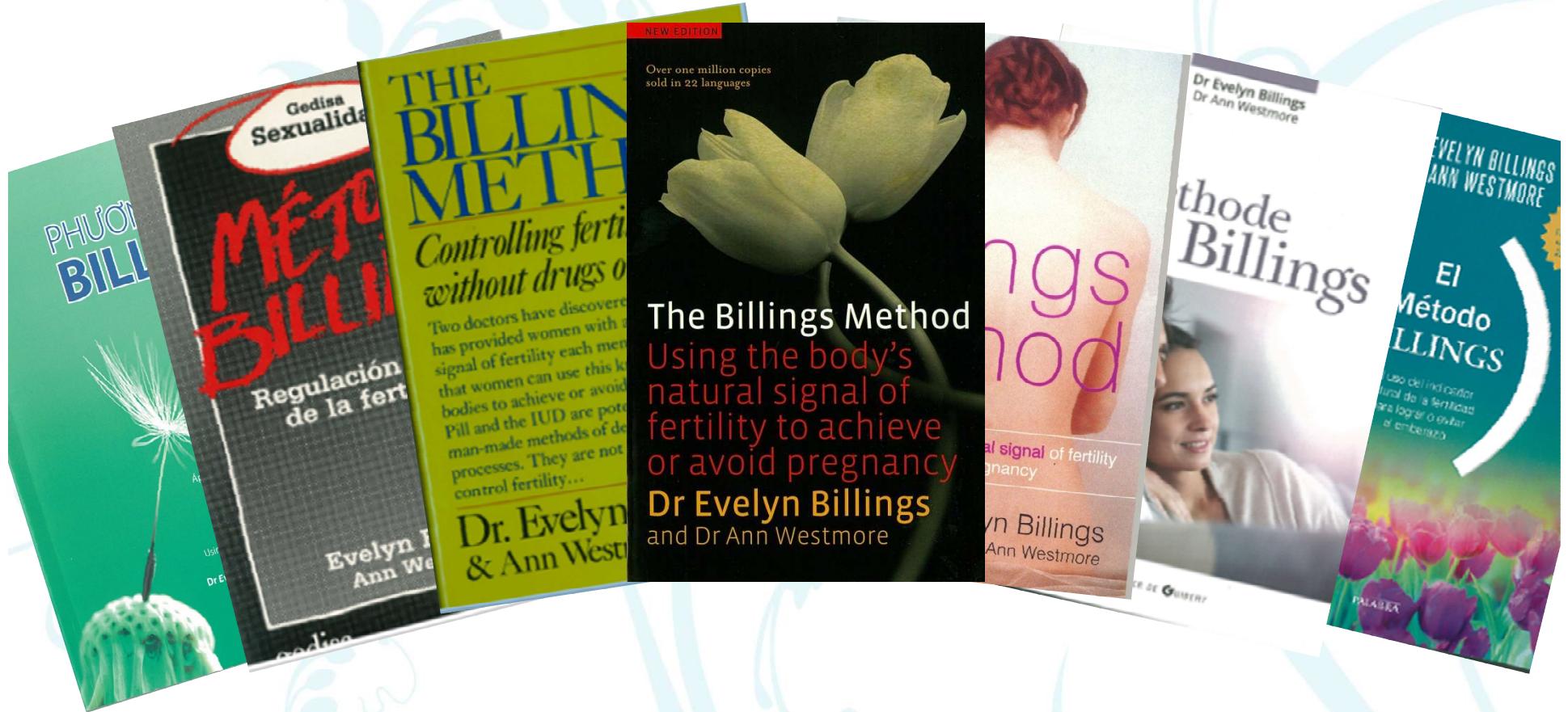
The macromolecular cores (several long molecules side by side) are shown in black, with the surrounding hydration cells (white). A sperm moving in the cervical plasma between the micelles of type E, and a non-invading sperm outside type G are also shown. From Odeblad (1973).

Reproduced with the permission of the editors of *Cervical Mucus in Human Reproduction*, World Health Organisation publication.

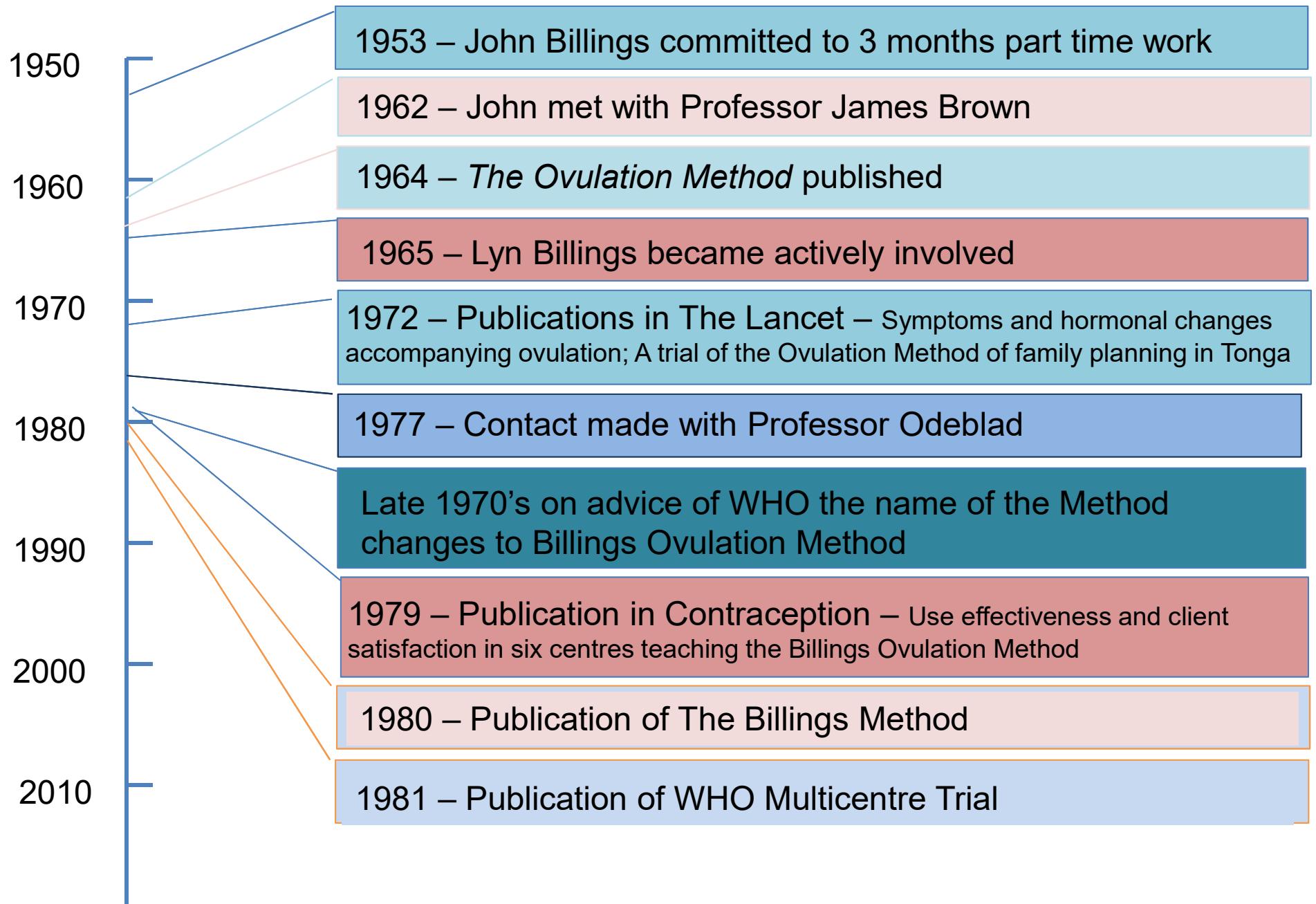




# The Billings Method™ goes public



available in book stores worldwide





## Contraception

Volume 19, Issue 6, June 1979, Pages 613-629



### Use-effectiveness and client satisfaction in six centers teaching the billings ovulation method

Hanna Klaus M.D. <sup>1, 1</sup>, Joan M. Goebel M.D. <sup>2</sup>, Beatrice Muraski <sup>3</sup>, Mary Therese Egizio R.N. <sup>4</sup>, Davey Weitzel <sup>5</sup>, Ruth S. Taylor M.D. <sup>6</sup>, Mary U. Fagan A.C.S.W. <sup>7</sup>, Kay Ek <sup>8</sup>, Kathleen Hobday M.D. <sup>9</sup>

Principal Investigator Dr Hanna Klaus  
Trial conducted from 1975 to 1977

Six clinics  
1090 couples  
10,215 cycles

Pregnancies  
Method Related Pregnancy Rate: 1%  
Teaching Related Pregnancy Rate: None

# A prospective multicentre trial of the ovulation method of natural family planning - I August. 1981, II November, 1981, III December 1983, IV April 1984, V May 1987

## Fertility and Sterility – World Health Organisation



Fertility and Sterility

Volume 47, Issue 5, May 1987, Pages 765-772



Gynecology-endocrinology

A prospective multicenter trial of the ovulation method of natural family planning. V. Psychosexual aspects

World Health Organization†‡

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[https://doi.org/10.1016/S0015-0282\(16\)59162-6](https://doi.org/10.1016/S0015-0282(16)59162-6)

During the 13-cycle effectiveness phase of a five-center study of natural family planning, there were substantial differences between developed and the three developing countries, in the total frequency of intercourse (mean when frequent)

FERTILITY AND STERILITY  
Copyright © 1984 The American Fertility Society

A PROSPECTIVE MULTICENTRE TRIAL OF THE OVULATION METHOD OF NATURAL FAMILY PLANNING. II. THE EFFECTIVENESS PHASE\*

WORLD HEALTH ORGANIZATION†

Task Force on Methods for the Determination of the Fertile Period, Special Programme of Research, Development and Research Training in Human Reproduction, World Health Organization, Geneva, Switzerland

A five-country prospective study was undertaken to determine the effectiveness of the ovulation method of natural family planning. After successful completion of a teaching phase of three cycles, 725 subjects entered a 13-cycle effectiveness phase and contributed 7514 cycles of observation. The overall cumulative net probability of discontinuation for the effectiveness study after 13 cycles was 35.6%; 19.6% due to pregnancy. Pregnancy rates per 100 woman-years calculated using the modified Pearl index were as follows: conscious departure from the rules of the method, 15.4; inaccurate application of instructions, 3.5; method failure, 2.8; inadequate teaching, 0.4; and uncertain, 0.5. *Fertil Steril* 36:591, 1981

FERTILITY AND STERILITY  
Copyright © 1984 The American Fertility Society

A prospective multicentre study of the ovulation method of natural family planning. IV. The outcome of pregnancy\*

Vol. 36, No. 5, November 1981  
Printed in U.S.A.

The Fertile Period, Special Programme of Research, Development and Research Training in Human Reproduction, World Health Organization, Geneva, Switzerland

lation method of natural family planning outcome in 163. There were 16 terminations (1.2%), including 6 induced abortions (3 spontaneous abortions do not differ with other fertility-regulating methods and 59 females, a difference in sex ratio from 100 and the estimated

Previous research

Vol. 41, No. 4, April 1984  
Printed in U.S.A.

FERTILITY AND STERILITY  
Copyright © 1984 The American Fertility Society

Methods for the Determination of the Fertile Period, Special Programme of Research, Development and Research Training in Human Reproduction, World Health Organization, Geneva, Switzerland

red twenty-five women of proven fertility recorded the presence of mucus at the vulva in 7514 menstrual cycles. The mean cycle length of the cycles was 28.5 days (standard deviation  $\pm 3.18$ ). The peak day of mucus was the last day of slippery, raw-egg-white-like mucus and occurred on the last day of the cycle. The fertile period was defined as any day on which mucus was present. Its mean length was 2.5 days (standard deviation  $\pm 0.8$ ) and

Vol. 36, No. 2, August 1981  
Printed in U.S.A.

A PROSPECTIVE MULTICENTRE TRIAL OF THE OVULATION METHOD OF NATURAL FAMILY PLANNING. I. THE TEACHING PHASE\*

WORLD HEALTH ORGANIZATION†

Task Force on Methods for the Determination of the Fertile Period, Special Programme of Research, Development and Research Training in Human Reproduction, World Health Organization, Geneva, Switzerland

The percentage of 869 women in five countries capable of being taught to recognize the periovulatory cervical mucus symptom of the fertile period was determined in a prospective multicentre trial of the ovulation method of natural family planning. The women were ovulating, of proven fertility, represented a spectrum of cultures and socioeconomic levels, and ranged from illiteracy to having postgraduate education. In the first of three standard teaching cycles, 93% recorded an interpretable ovulatory mucus pattern. Eighty-eight per cent of subjects successfully completed the teaching phase; 7% discontinued for reasons other than pregnancy, including 1.3% who failed to learn the method. Forty-five subjects (5%) became pregnant during the average 3.1-cycle teaching phase. The average number of days of abstinence required by the rules of the method was 17 in the third teaching cycle (58.2% of the average cycle length). To what extent the findings of this study can be extended to other couples remains to be demonstrated. *Fertil Steril* 36:152, 1981

A prospective multicentre trial of the ovulation method of natural family planning - I August. 1981, II November, 1981, III December 1983, IV April 1984, V May 1987

## Fertility and Sterility – World Health Organisation

### 5 Country Trial

India, El Salvador

New Zealand, Ireland

The Philippines



869 couples were recruited between 1976 and 1978.

Over 10,215 monthly cycles were assessed.

Method pregnancy rate 2.9%. Pregnancy rate due to teacher failure 3.9%

"94% of women representing a wide range of cultural, educational, and socio economic characteristics were able to recognize and record the cervical mucus symptom which allows self recognition of the fertile period." –93% recorded an interpretable ovulatory mucus pattern in first cycle

"Advocates of natural family planning methods emphasized the importance of the quality of teaching in determining the success or failure of the method being practiced. Objective assessment of the competence of the teachers of the OM to teach and record the data required for the present study has been difficult to achieve in every centre."

# 1995 a big year

The Indian Council of Medical Research published an independent study in *Contraception*

Contraception  
Volume 53, Issue 2, February 1996, Pages 69-74

Original research article  
Field trial of Billings Ovulation Method of natural family planning  
Indian Council of Medical Research Task Force on Natural Family Planning  
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[https://doi.org/10.1016/0010-7824\(95\)00269-3](https://doi.org/10.1016/0010-7824(95)00269-3) Get rights and content

**Abstract**  
There are couples with unmet family planning needs and couples who do not use any modern method, yet they desire to space or avoid pregnancies. Many of them look for safe and effective options like the natural family planning methods. The Billings Ovulation Method based on single index cervical mucus parameter is one such option. The present multicentre trial conducted in India has shown an encouraging use-effectiveness of the method, indicating method failure as low as  $1.5 \pm 0.3$  and use-failure  $15.9 \pm 0.8$  per 100 users at 21 months. The method continuation rates have also been as high as 88.3100 users at 6 months and 52.0100 users at 21 months.

2059 women over 21 months

Method Related Pregnancy – 0.86%  
User Related Pregnancy – 9.1%  
Continuation Rates – 88.3% at 6 months and 52% at 21 months

# 1995 a big year

Australia's aid agency AusAID provided funds for a three year project in the Anhui Province, China.

The beginning of many, many kilometres travelled and thousands of teachers trained

Jiangsu Family Health Institute, China (1997).

Presented at a Congress,  
Centre for Study and  
Research in the Natural  
Regulation of Fertility.  
**Dr QIAN Shao Zhen**

1654 women – 2 Groups

1. BOM - 992
2. IUD - 662

16,169 women months of use

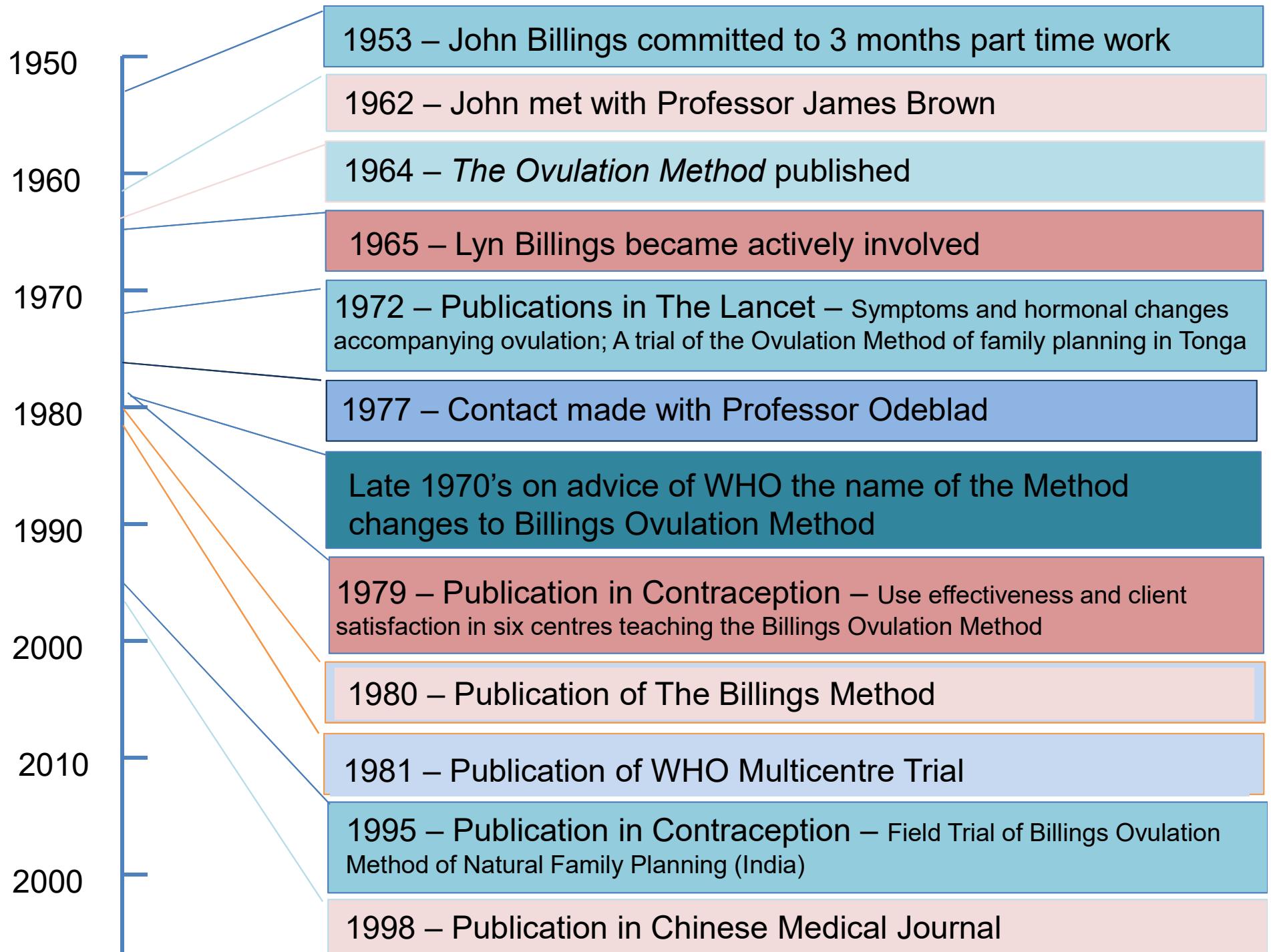
For BOM users

Method Pregnancies – 0%

User Pregnancies – 5 (0.5%)

For IUD users

12 pregnancies, 15 expulsions  
and 38 removals

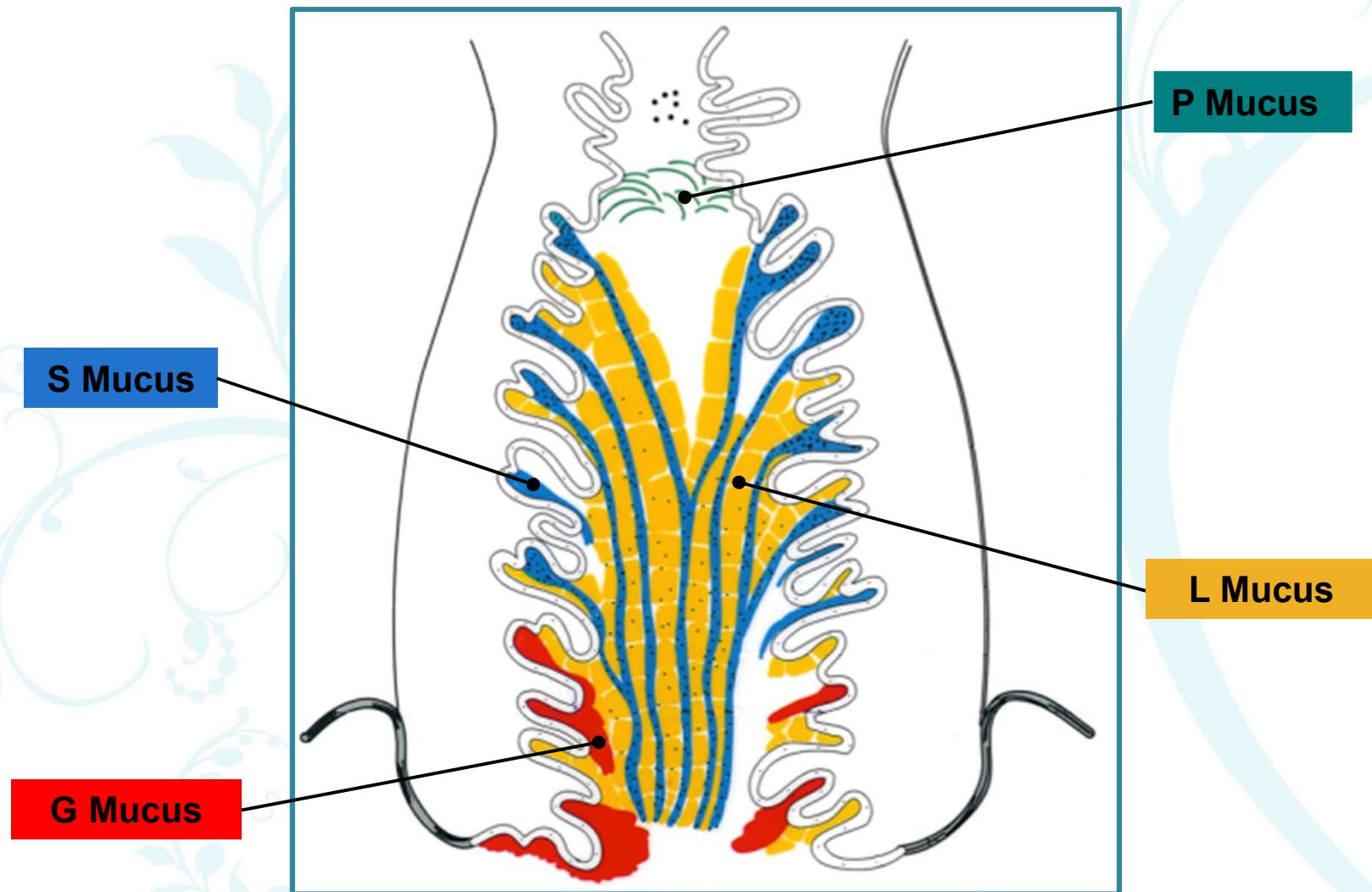


# And the publications kept coming.....

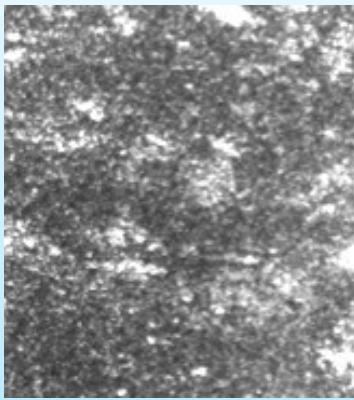
- 1977 – Odeblad E, ‘Physical properties of cervical mucus’, *Plenum Press*
- 1981 - Brown JB, Harrisson P, Smith MA & Burger HG, ‘Correlation between the mucus Symptom amd the Hormonal Markers of Fertility throughout Reproductive Life’, *Advocate Press*
- 1985 – Brown JB, Harrisson P & Smith MA, ‘A study of returning fertility after childbirth, during lactation, by measurement of urinary oestrogen and pregnanediol excretion and cervical mucus production’, *Journal of Biosocial Science*
- 1993 – Ryder REJ, “Natural family planning”: effective birth control supported by the Catholic Church, *British Medical Journal*
- 1996 – Dou FB, Zuo HZ, Qian SZ, ‘Physiological consideration of natural fertility regulation’ *J. Prac. Androl (China)*
- 1997 – Zou HZ, Duo FB, Qian SZ, “Introduction to natural fertility regulation’ *Reprod Contrcep. (China)*
- 1997 – Odeblad E, ‘Cervical mucus and their function’, *Journal of Irish Colleges of Physicians and Surgeons*
- 1998 – Menarguez M, “Studies on cervical mucus with scanning electron microscope’, *Thesis, University of Murcia, Spain.*
- 2003 – Menarguez M, Pastor LM & Odeblad E, ‘Morphological characterization of different human cervical mucus types using light and scanning electron microscopy’, *Human Reproduction*



# Map of the Lateral Walls of the Cervix



**G mucus**



## G mucus

Closes the cervix for most of the cycle. Protects woman's reproductive system from infection



## G mucus

Sperm cannot enter the cervix  
but are kept out in the vagina  
where they die very quickly



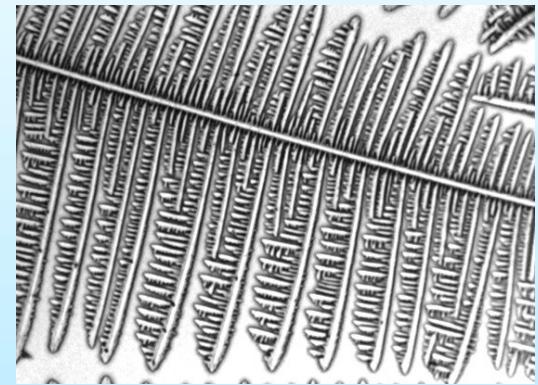
Infertile  
phase

### G mucus

Closes the cervix for most of the cycle. Sperm cannot enter the cervix but are kept out in the vagina where they die very quickly



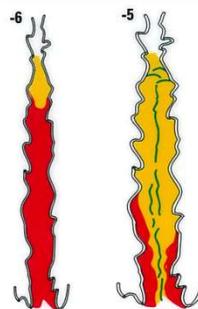
### L mucus



### P mucus

### G mucus

Closes the cervix for most of the cycle. Sperm cannot enter the cervix but are kept out in the vagina where they die very quickly



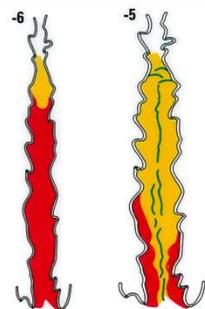
Fertile phase  
has begun

### L mucus

Supports the P and the string like S mucus. Attracts low quality sperm which are eliminated. Locks high quality sperm into S crypts

### G mucus

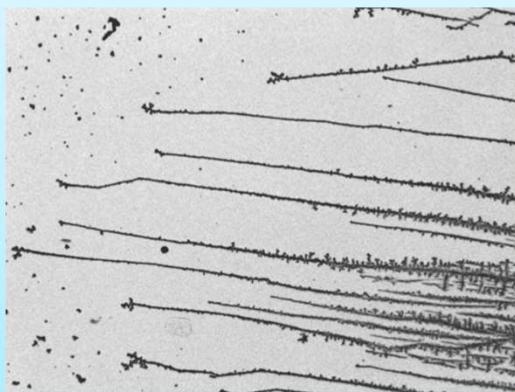
Closes the cervix for most of the cycle. Sperm cannot enter the cervix but are kept out in the vagina where they die very quickly



### L mucus

Supports the P and the string like S mucus. Attracts low quality sperm which are eliminated. Locks high quality sperm into S crypts

### S mucus

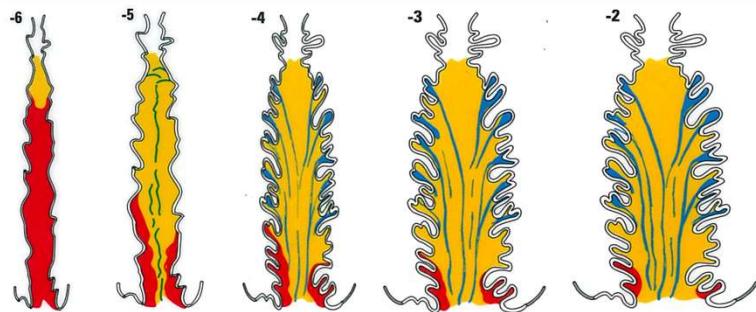


### G mucus

Closes the cervix for most of the cycle. Sperm cannot enter the cervix but are kept out in the vagina where they die very quickly

### L mucus

Supports the P and the string like S mucus. Attracts low quality sperm which are eliminated. Locks high quality sperm into S crypts



Fertile phase continues,  
changing sensation at vulva

### S mucus

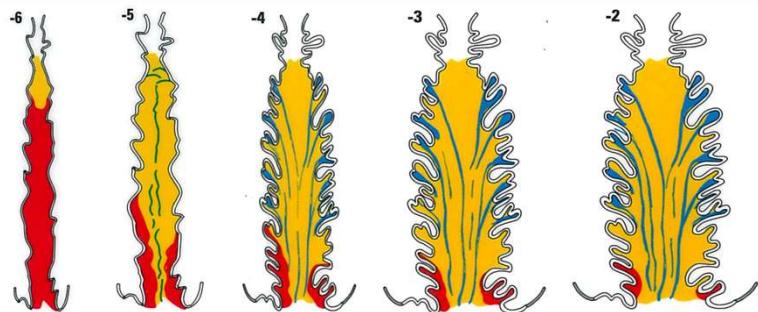
Provides nourishment for the high quality sperm and the channels for their transport to the S crypts. Sperm can live 3-5 days

### G mucus

Closes the cervix for most of the cycle. Sperm cannot enter the cervix but are kept out in the vagina where they die very quickly

### L mucus

Supports the P and the string like S mucus. Attracts low quality sperm which are eliminated. Locks high quality sperm into S crypts



### S mucus

Provides nourishment for the high quality sperm and the channels for their transport to the S crypts. Sperm can live 3-5 days

### P mucus

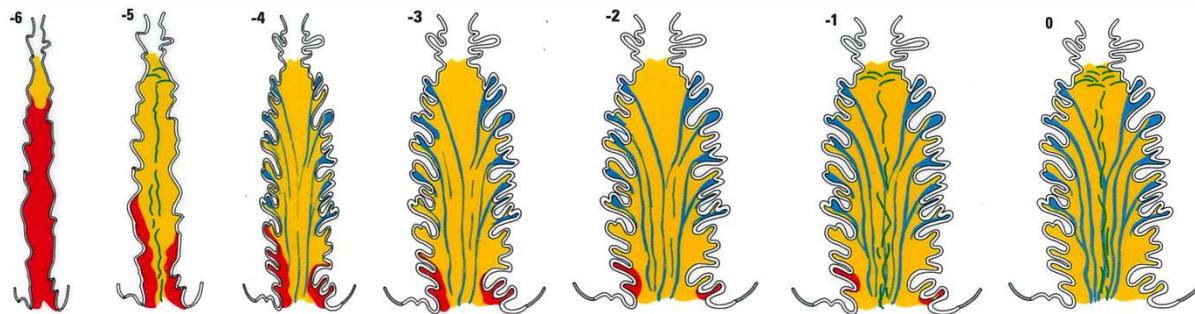


### G mucus

Closes the cervix for most of the cycle. Sperm cannot enter the cervix but are kept out in the vagina where they die very quickly

### L mucus

Supports the P and the string like S mucus. Attracts low quality sperm which are eliminated. Locks high quality sperm into S crypts



### S mucus

Provides nourishment for the high quality sperm and the channels for their transport to the S crypts. Sperm can live 3-5 days

### P mucus

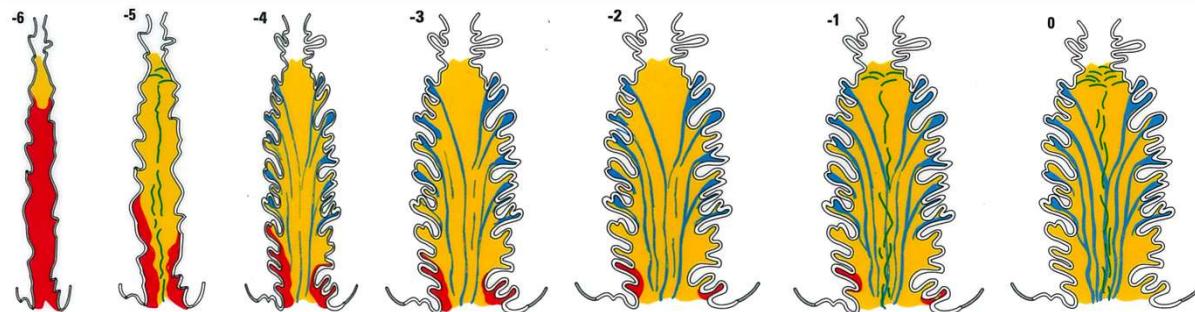
Liquefies the L mucus, releasing sperm from the S crypts, which are now conveyed by the P mucus to the ovum.

### G mucus

Closes the cervix for most of the cycle. Sperm cannot enter the cervix but are kept out in the vagina where they die very quickly

### L mucus

Supports the P and the string like S mucus. Attracts low quality sperm which are eliminated. Locks high quality sperm into S crypts



Cervix has reached peak development  
Vulva is slippery and swollen

### S mucus

Provides nourishment for the high quality sperm and the channels for their transport to the S crypts. Sperm can live 3-5 days

### P mucus

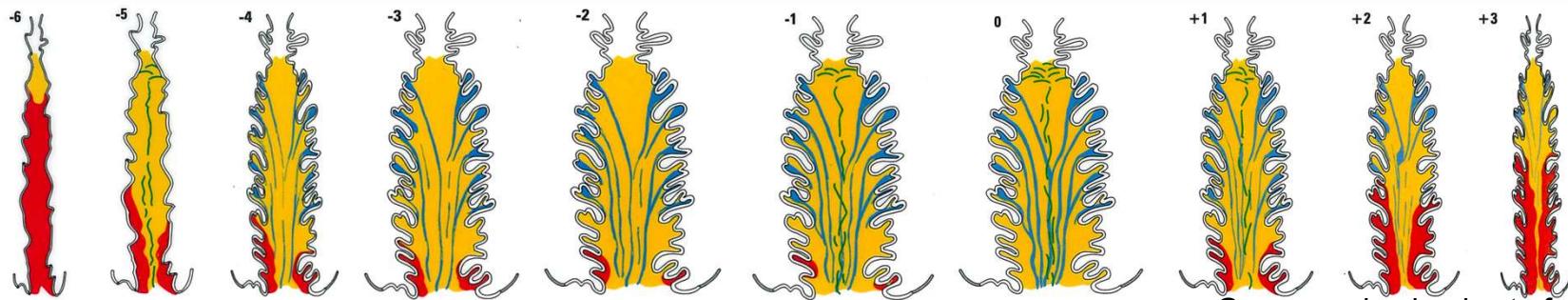
The liquefying effect of the P mucus dissolves the L and S mucus so that the woman has a very lubricative sensation at the vulva often without visible mucus

### G mucus

Closes the cervix for most of the cycle. Sperm cannot enter the cervix but are kept out in the vagina where they die very quickly

### L mucus

Supports the P and the string like S mucus. Attracts low quality sperm which are eliminated. Locks high quality sperm into S crypts



G mucus plug begins to form  
Channels for sperm transport  
exist in diminishing numbers

### S mucus

Provides nourishment for the high quality sperm and the channels for their transport to the S crypts. Sperm can live 3-5 days

### P mucus

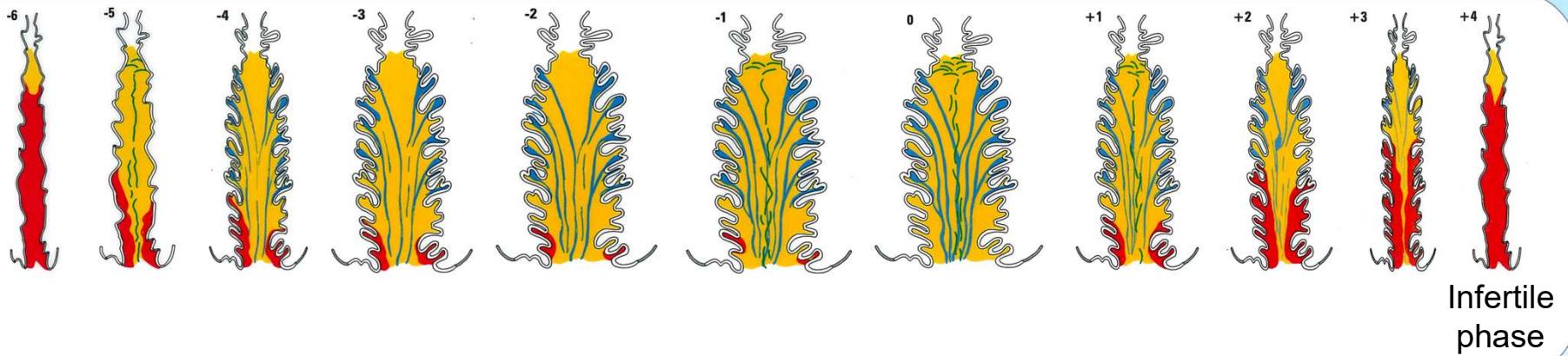
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## S mucus

Provides nourishment for the high quality sperm and the channels for their transport to the S crypts. Sperm can live 3-5 days

## P mucus

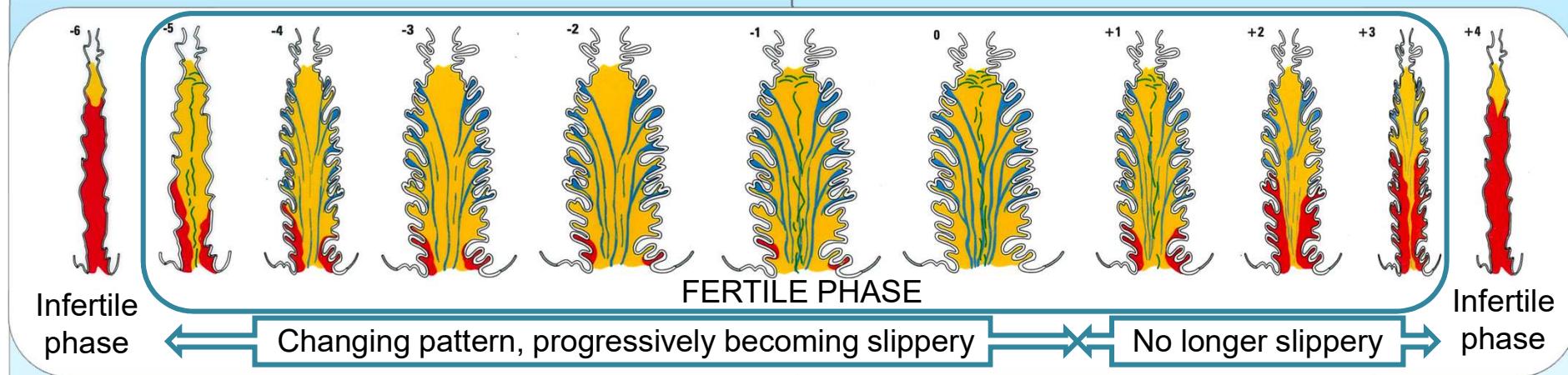
The liquefying effect of the P mucus dissolves the L and S mucus so that the woman has a very lubricative sensation at the vulva often without visible mucus

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## S mucus

Provides nourishment for the high quality sperm and the channels for their transport to the S crypts. Sperm can live 3-5 days

## P mucus

The liquefying effect of the P mucus dissolves the L and S mucus so that the woman has a very lubricative sensation at the vulva often without visible mucus

*To every thing there is a season,  
and a time to every purpose under  
heaven*

*Ecclesiastes 3:1*

## Professor Odeblad and the Pockets of Shaw

Krantz, K. E.: The Gross and Microscopic Anatomy of the Vagina. Annals New York Academy of Sciences 83, 89 - 104 (1959).

Odeblad, E. Studies on Vaginal Contents and Cells with Proton Magnetic Resonance. Annals of the New York Academy of Sciences 83, 189 - 206 (1959).

Odeblad, E. Some Investigations with Nuclear Magnetic Resonance on Water Associated with the Vaginal Cells. Acta Obstetricia et Gynecologica Scandinavica 39, 528-539 (1960).

Odeblad, E. Intracavitory Circulation of Aqueous Material in the Human Vagina. Acta Obstetricia et Gynecologica Scandinavica 43, 360 - 368 (1964).

Odeblad, E. An NMR - Method for Determination of Ovulation. Acta Obstetricia et Gynecologica Scandinavica 47: Suppl 8, 39 - 47 (1968).

Rudolfsson, E., Odeblad, E. Identification of Manganese in Vaginal Contents Using Electron Spin Resonance. Acta Isotopica 11, 5 - 16 (1971).

Hagenfeldt, K., Plantin, L., Diczfalussy, E. Trace Elements in the Human Endometrium. Acta Endocrinologica 72, 115 – 126 (1973).

Kopito, L., Kosasky, H., Sturgis, S., Lieberman, B., Shwachman, H. Water and Electrolytes in Human Cervical Mucus. Fertility and Sterility 24 (7), 499 - 506 (1973)

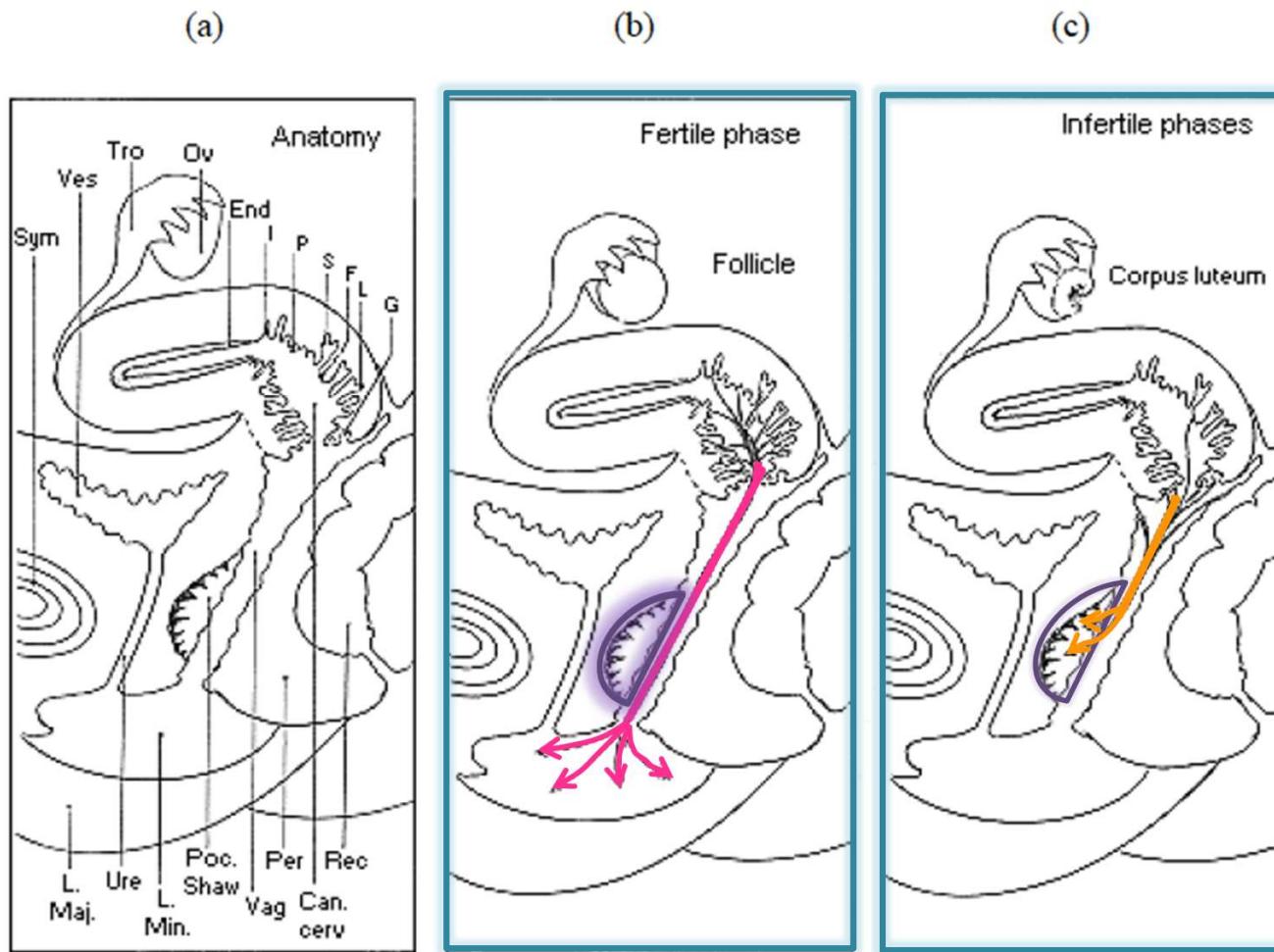
Odeblad, E., Ingelman-Sundberg, A., Hallstrom, L., Hoglund, A. The biophysical Properties of the Cervical - Vaginal Secretions. International Review of Natural Family Planning 7 (1), 1- 56 (1983).

Taylor, R., Woods, J., Guapo, M. Correlation of Vaginal Hormone Cytoprams with Cervical Mucus Symptoms as Observed by Women Using the Ovulation Method of Natural Family Planning. The Journal of Reproductive Medicine 31 (3), 167 - 172 (1986).

Odeblad, E. "The Cervix, the Vagina and Fertility" in the Billings Atlas of the Ovulation Method: The mucus Patterns of Fertility and Infertility. 5th Edition. E. L. Billings, J. J. Billings, M. Catarinich. Ovulation Method Research and Reference Centre of Australia: Melbourne (1989).

Odeblad, E. The Discovery of Different Types of Cervical Mucus and the Billings Ovulation Method. Bulletin of the Natural Family Planning Council of Victoria 21 (3), 3 - 34. Sept. (1994)

# Pockets of Shaw



Reabsorption by the Pockets of Shaw is reduced during the fertile phase because of the thickening of the preovulatory vaginal epithelium

## HYPOTHALAMUS

Oestradiol and Progesterone

Gonadotrophin Releasing Hormone (GnRH)

## OVARY

## PITUITARY

Follicle Stimulating Hormone (FSH) and Luteinising Hormone (LH)

# FSH – two levels

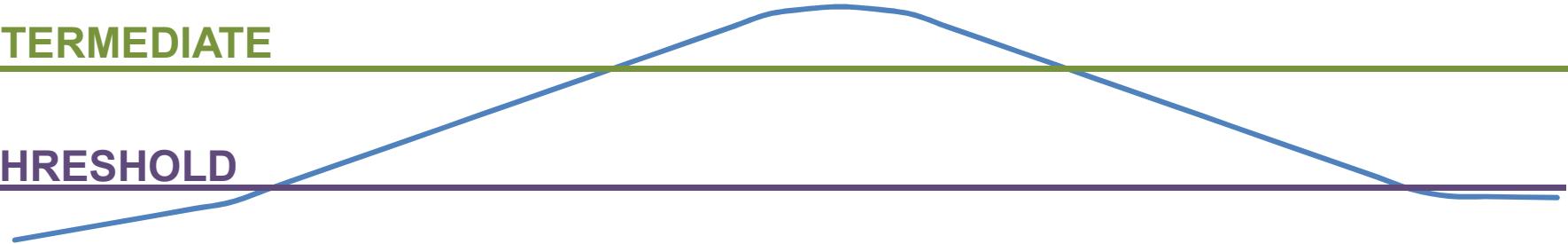
**threshold** – needed for follicle recruitment and beginning of rapid growth phase

**intermediate** – needed for continuing growth and the emergence of a dominant follicle

**the fall** - below threshold of all follicles except the dominant

**INTERMEDIATE**

**THRESHOLD**

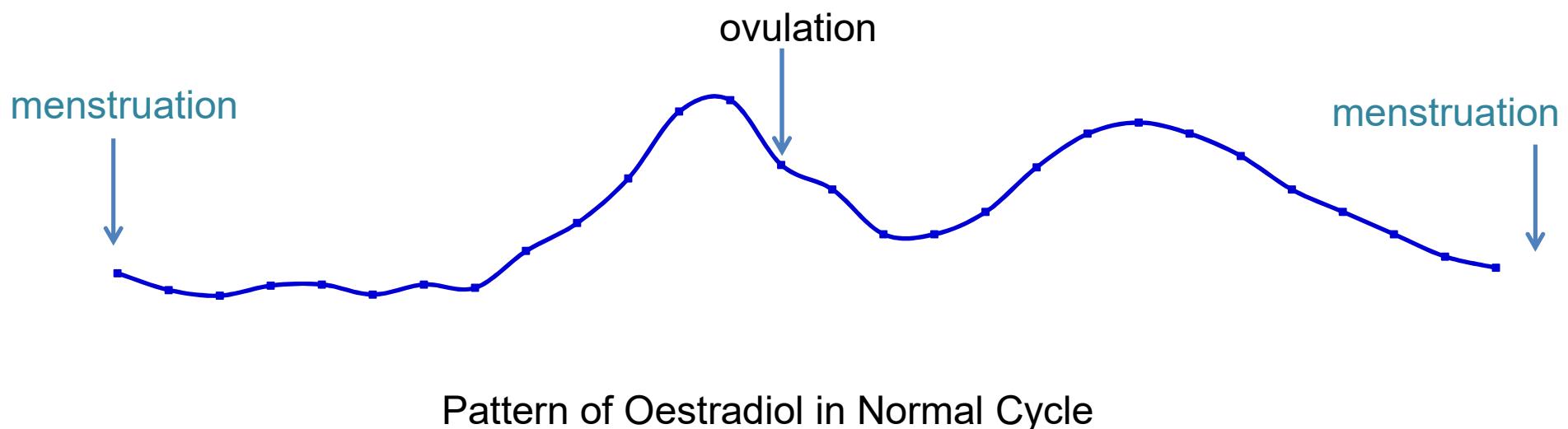


# Oestradiol

Production directly correlates to the growth and demise of follicles

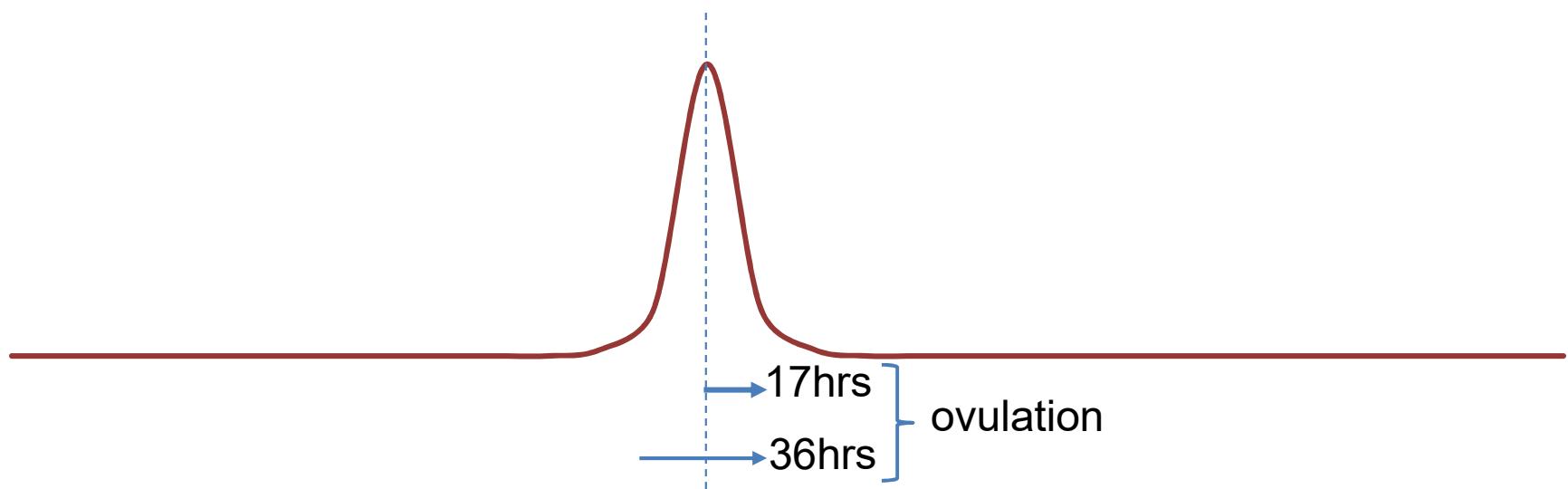
Rising levels stimulate growth of endometrium

Cervix responds to changing levels



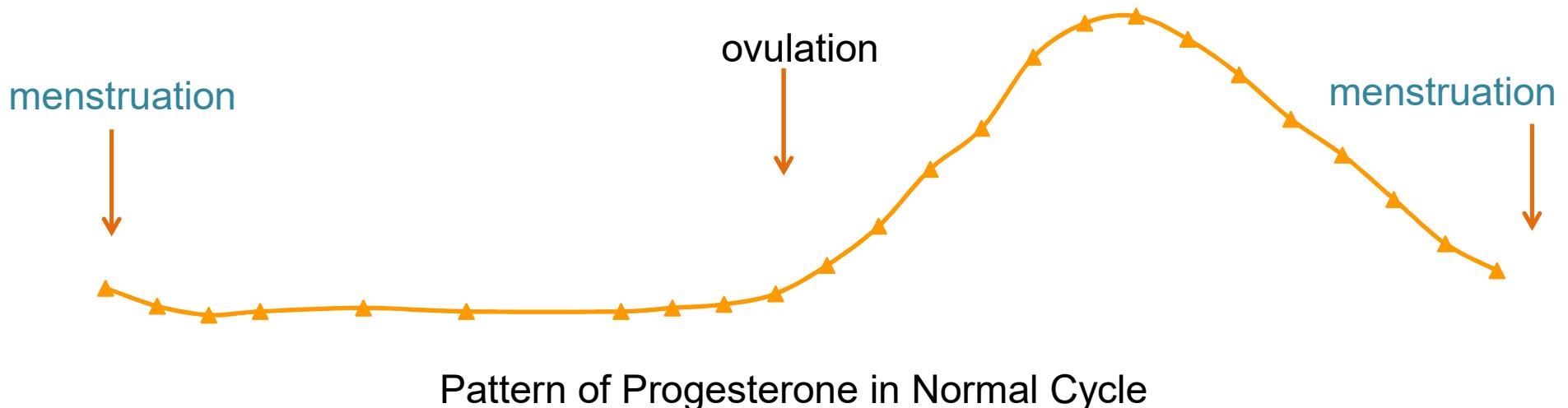
# LH

- Surge of LH causes luteinisation of the follicle
- This, in turn, results in the beginning of the progesterone production and starts the ovulatory mechanism
- 36 hours after beginning of surge, 17 hours after peak – OVULATION occurs
- Initiates the conversion of the residual follicle to a Corpus Luteum

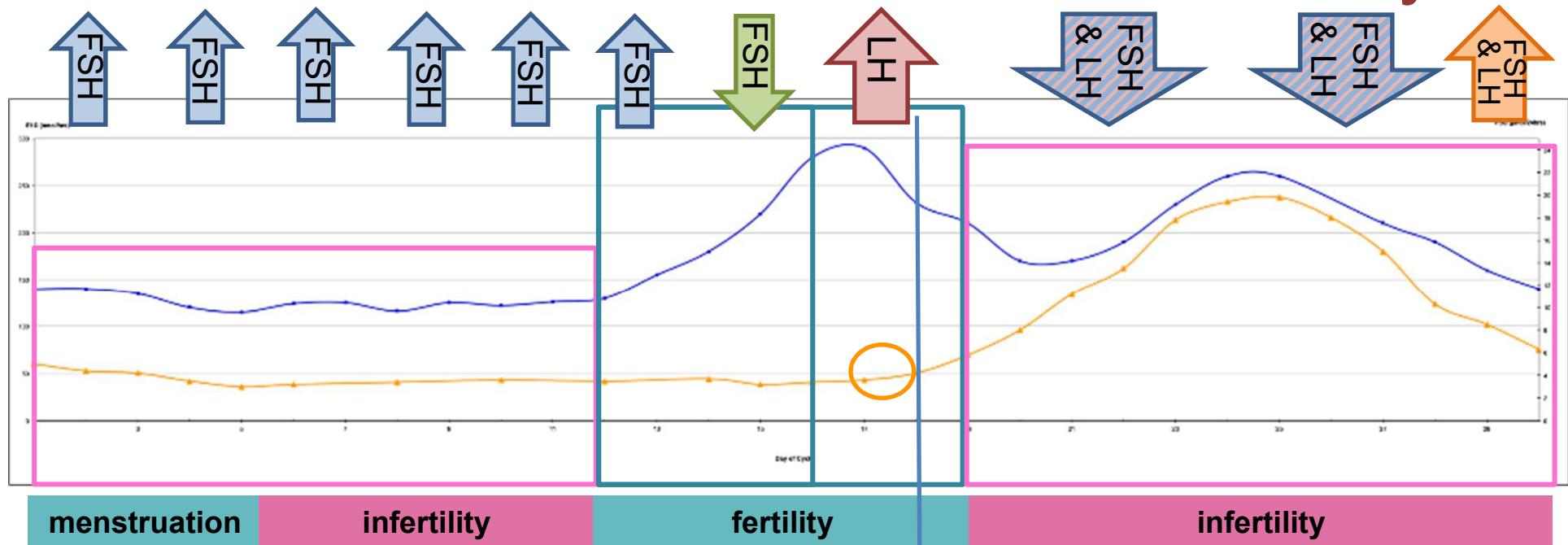


# Progesterone

- Small increase prior to ovulation, important process in the mechanism of ovulation
- Produced in increasing amounts by the corpus luteum after ovulation
- Cervix responds to changing levels
- Influences the functioning of the Pockets of Shaw for majority of the cycle
- Along with high oestradiol levels suppresses FSH and LH during the luteal phase



# Hormones of the Normal Menstrual Cycle



menstruation

infertility

fertility

infertility

ovulation

Oestradiol and progesterone levels low  
Ovary quiescent

Oestradiol levels rising  
Follicles rapidly growing

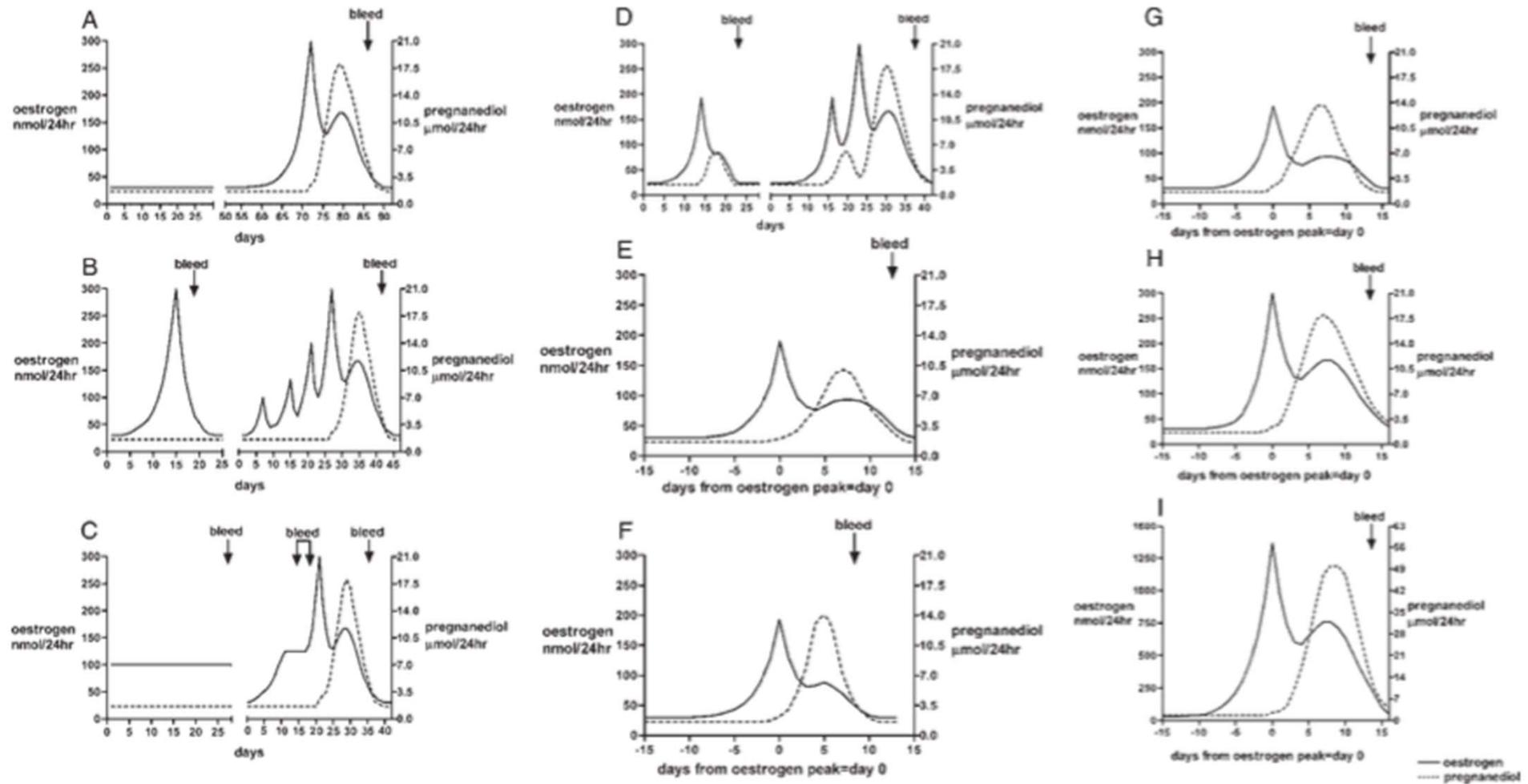
High levels of oestradiol trigger LH surge. **Dominant follicle ovulates.**  
Ovum lives for up to 24 hours

Progesterone and oestradiol levels high  
Ovum is dead  
Ovulation cannot occur again this cycle  
Menstruation begins 11-16 days after ovulation

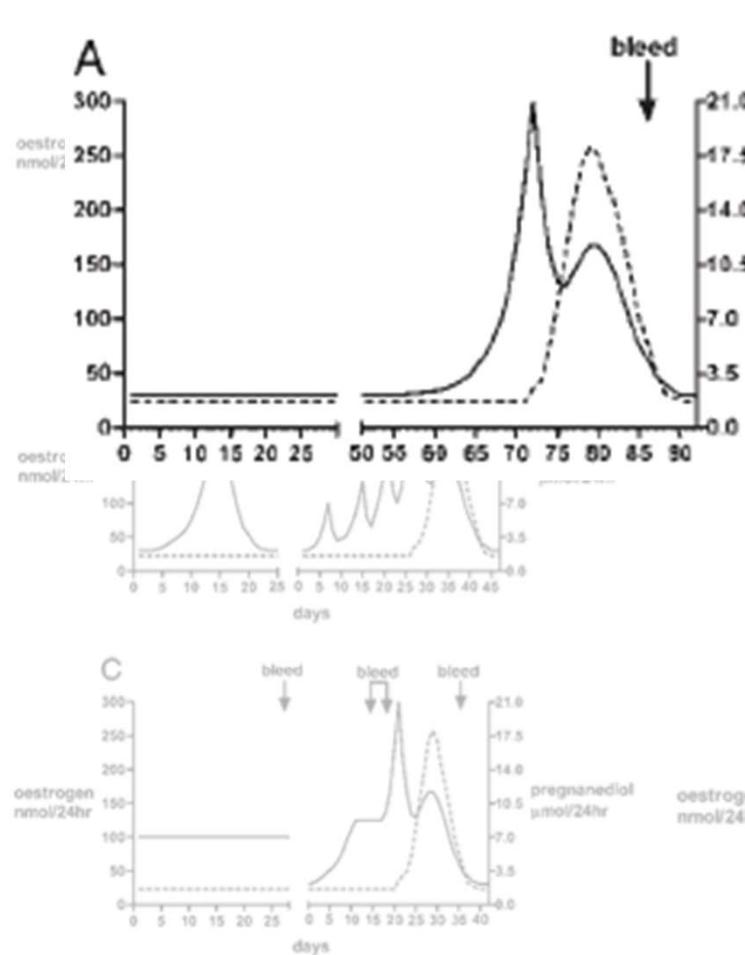
# Continuum of Ovarian Activity

- For most of her fertile life, a woman will experience fertile ovulatory cycles
- However women will normally experience infertile variants of the ovulatory cycle, particularly during:-
  - *Approach of menarche*
  - *Approach of menopause*
  - *Breastfeeding/weaning*
  - *Periods of stress*
- Hormone patterns differ from the fertile ovulatory cycle
- Women who are post hormonal contraception may also experience these variants.

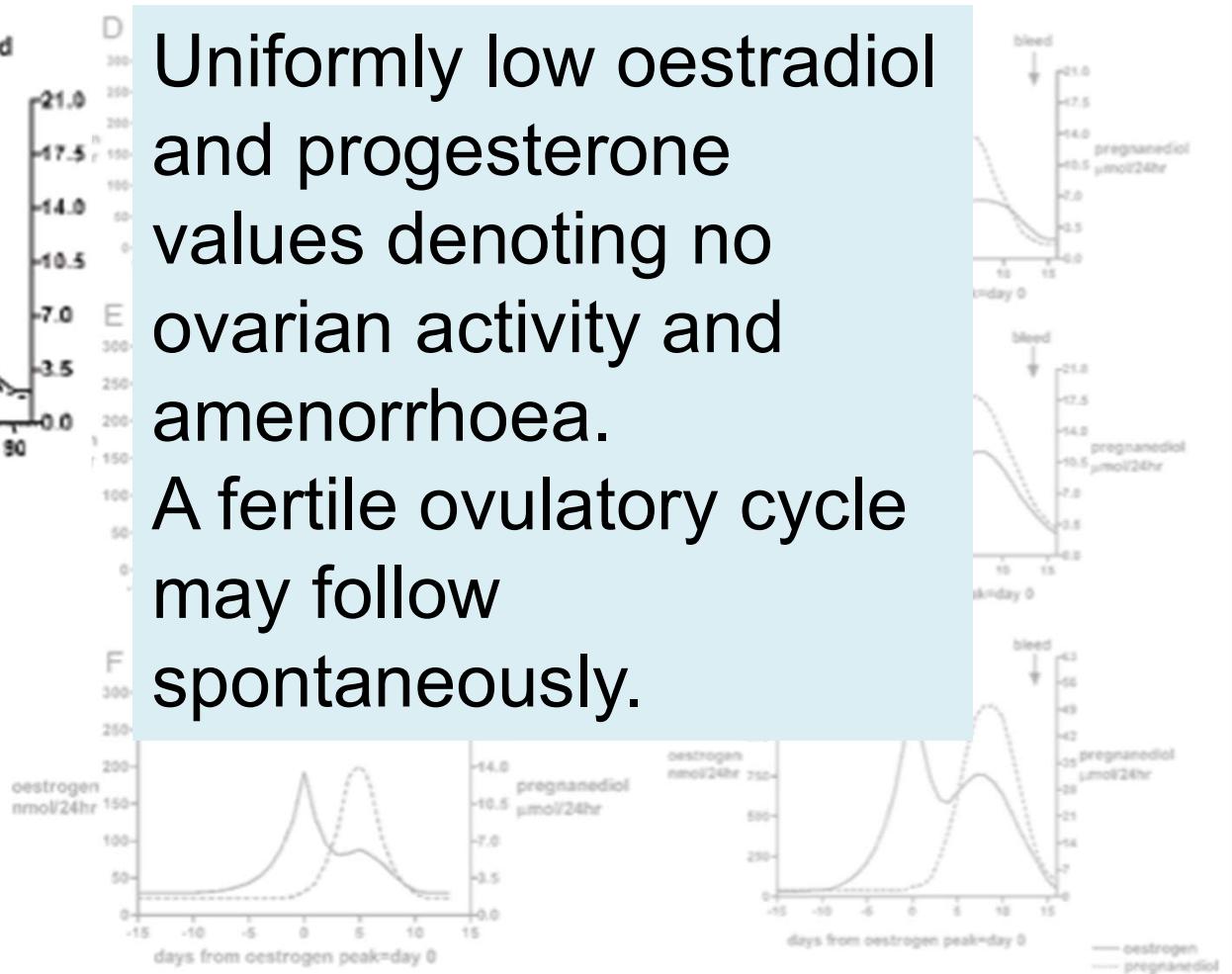
# The Continuum and the Cycle Variants



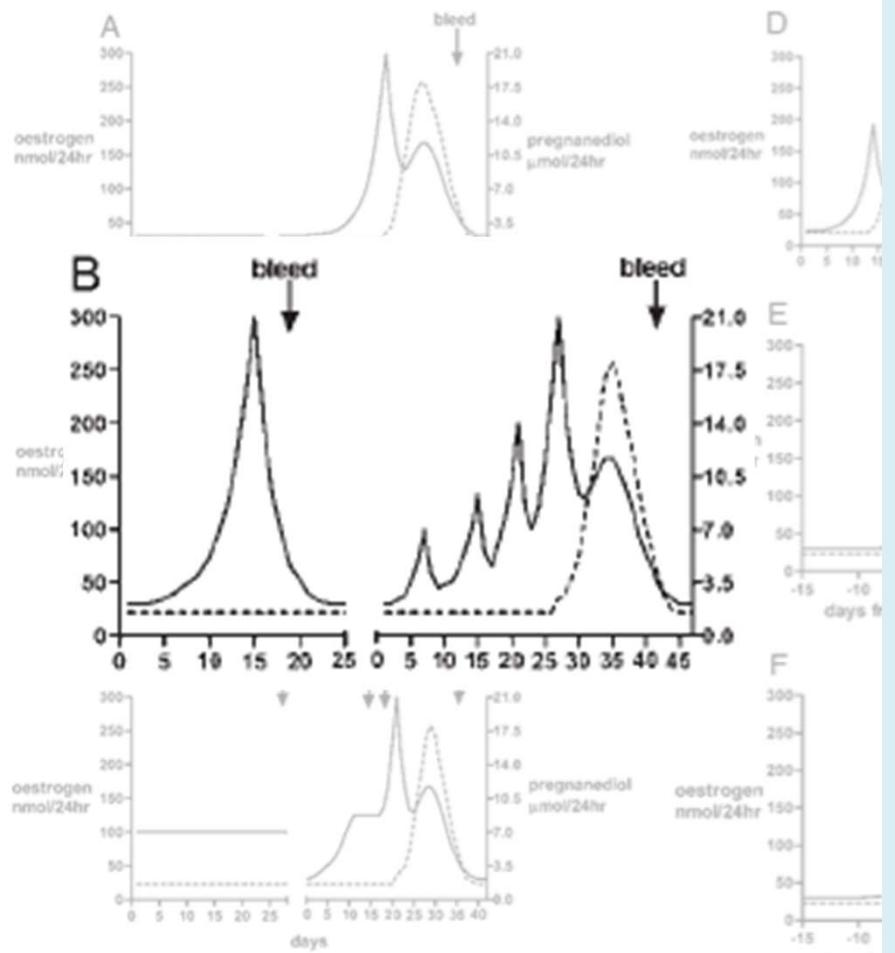
# The Continuum and the Cycle Variants



Uniformly low oestradiol and progesterone values denoting no ovarian activity and amenorrhoea.  
A fertile ovulatory cycle may follow spontaneously.



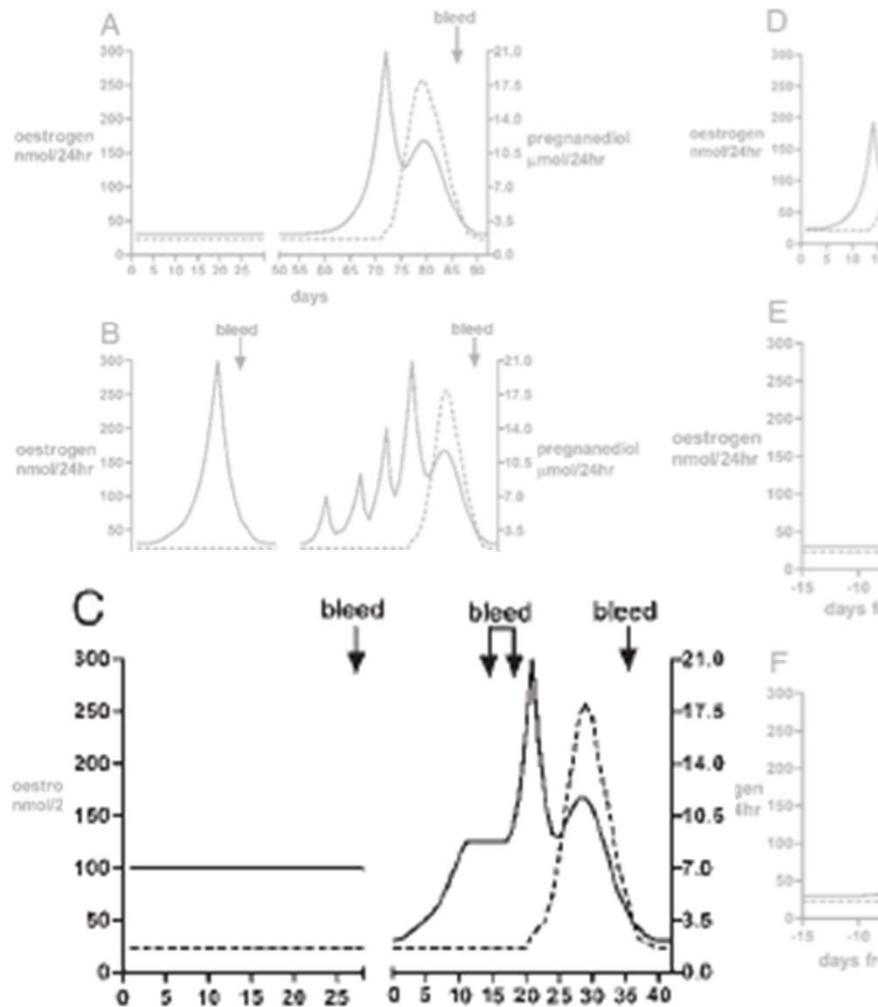
# The Continuum and the Cycle Variants



Anovular ovarian activity with a sharp oestradiol peak followed closely by oestrogen withdrawal bleeding

A possible sequel - several anovulatory oestradiol peaks, confirmed by absence of a progesterone rise. Eventually followed by fertile cycle.

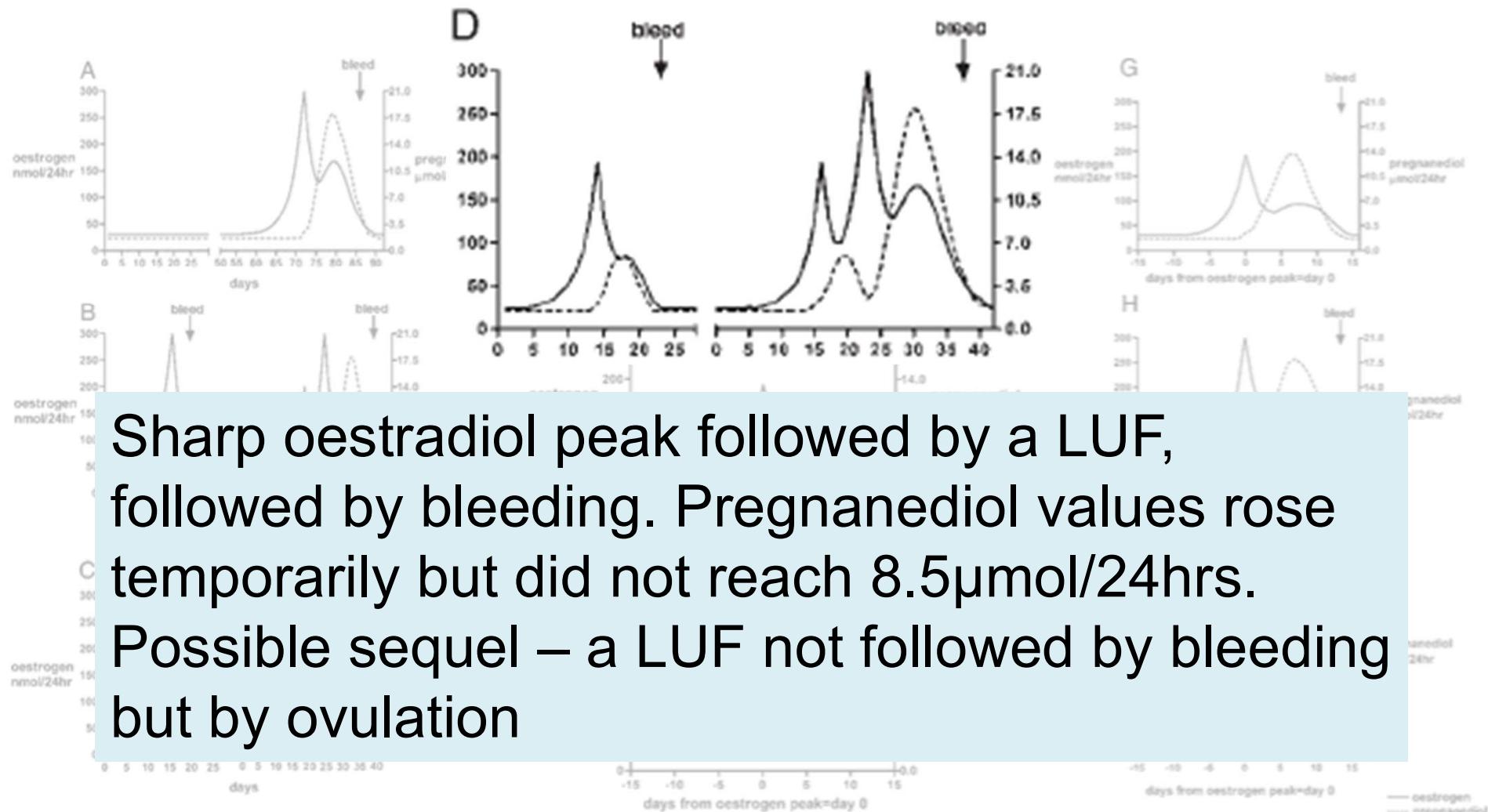
# The Continuum and the Cycle Variants



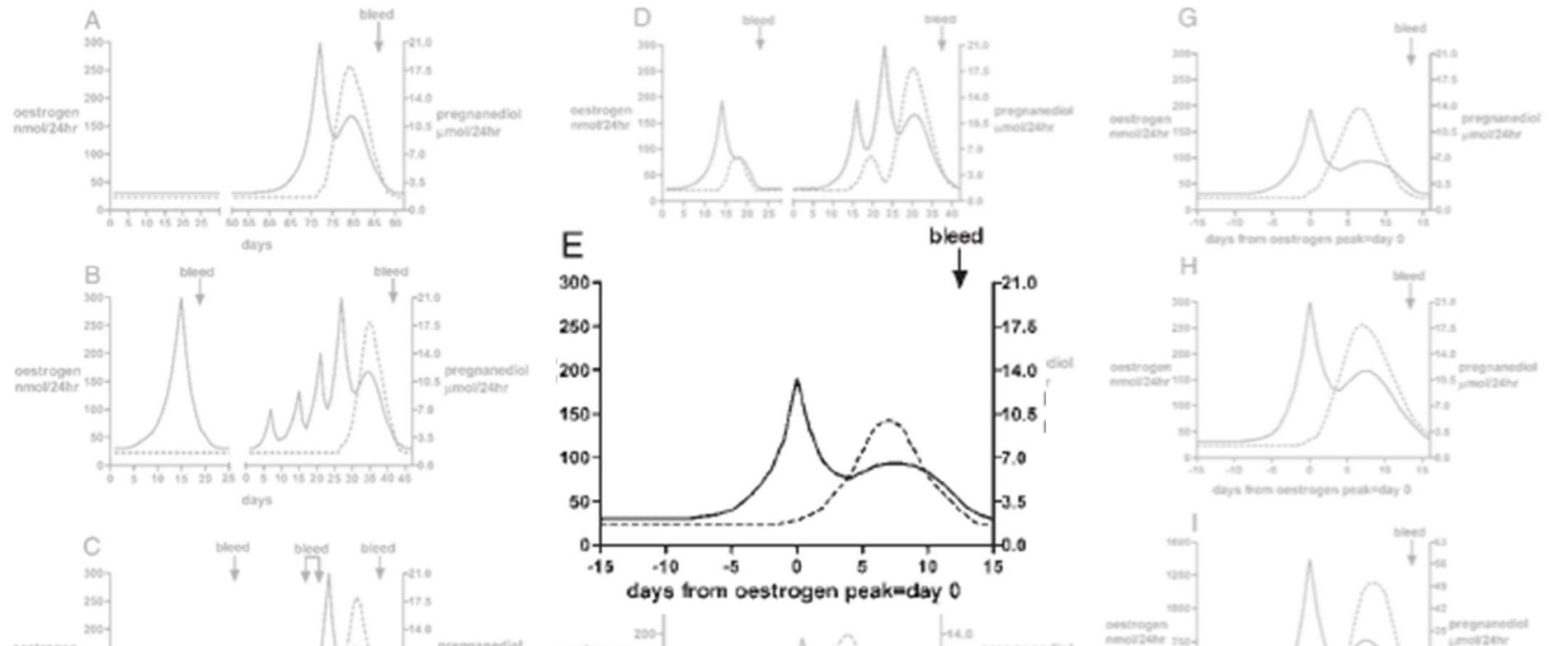
Anovular ovarian activity with constant raised oestradiol excretion and oestrogen breakthrough bleeding

Possible sequel – situation correcting itself and progressing to a fertile ovulatory cycle.  
Oestrogen breakthrough bleeding mid cycle may occur.

# The Continuum and the Cycle Variants

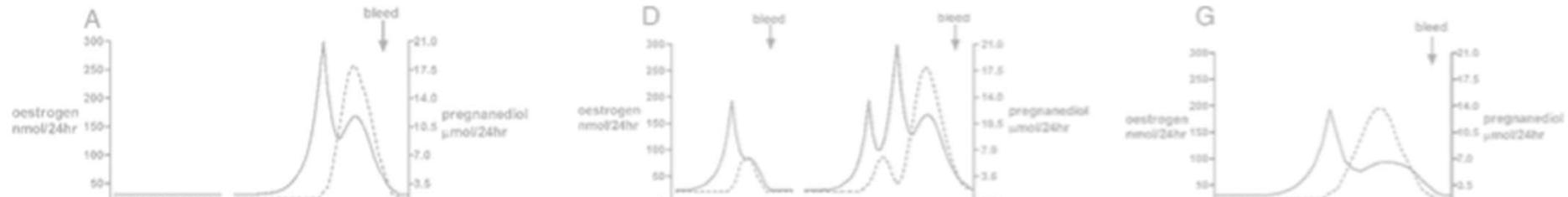


# The Continuum and the Cycle Variants

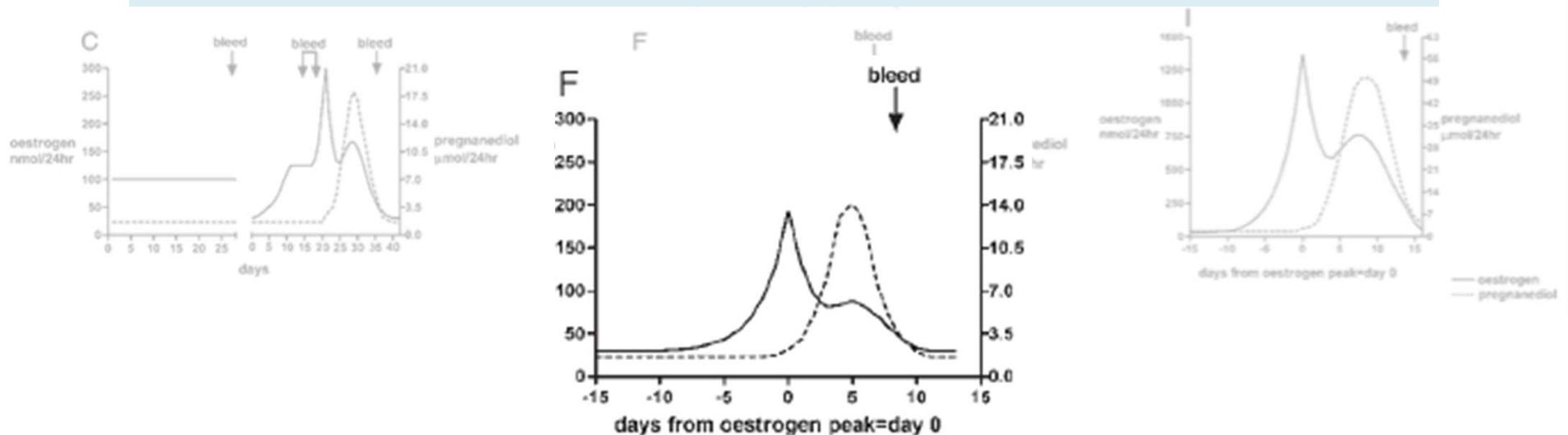


Ovulation followed by a deficient luteal phase.  
Pregnadiol levels exceeded  $8.5\mu\text{mol}/24\text{hrs}$   
but did not reach  $13.5\mu\text{mol}/24\text{hrs}$ .  
Menstruation followed.

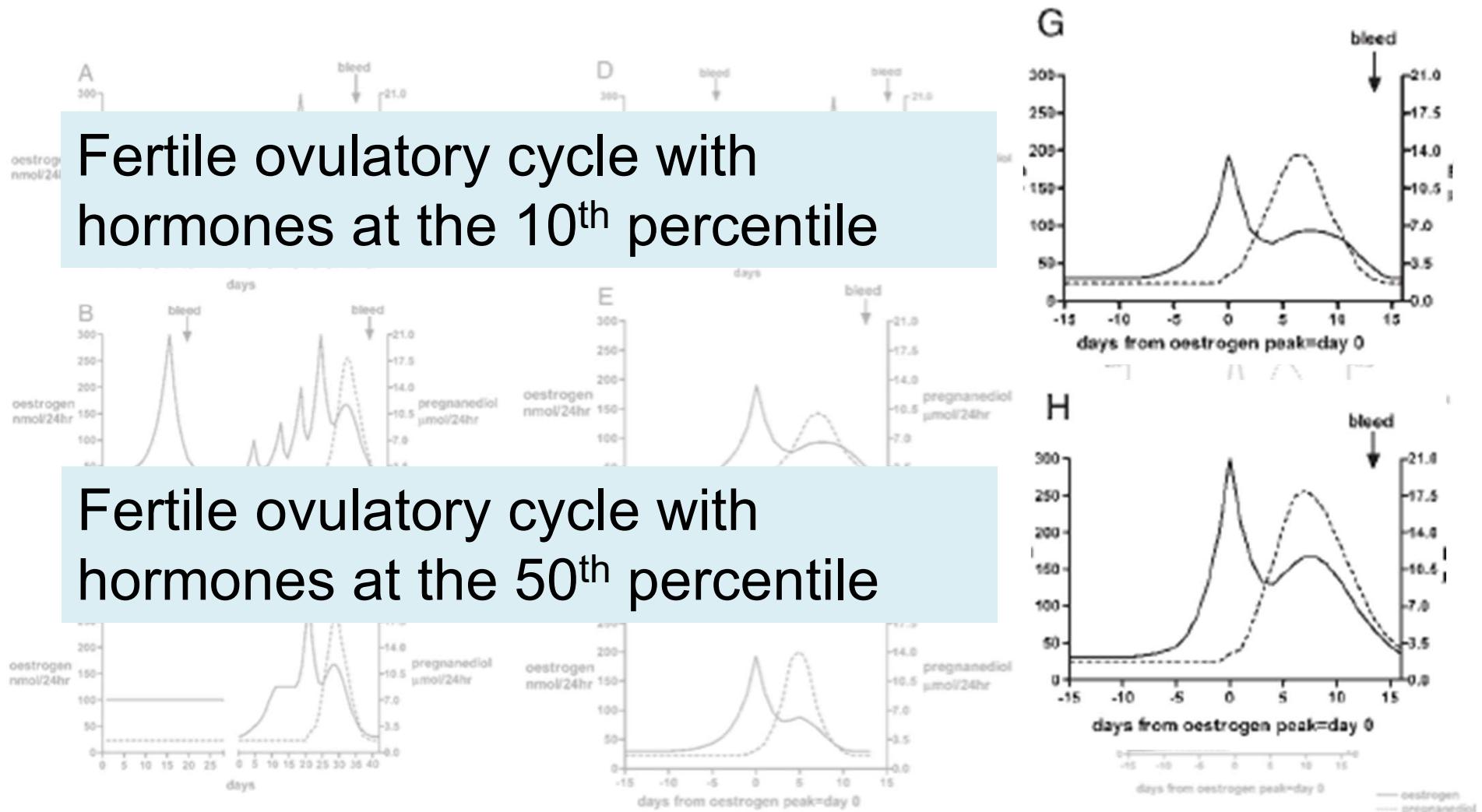
# The Continuum and the Cycle Variants



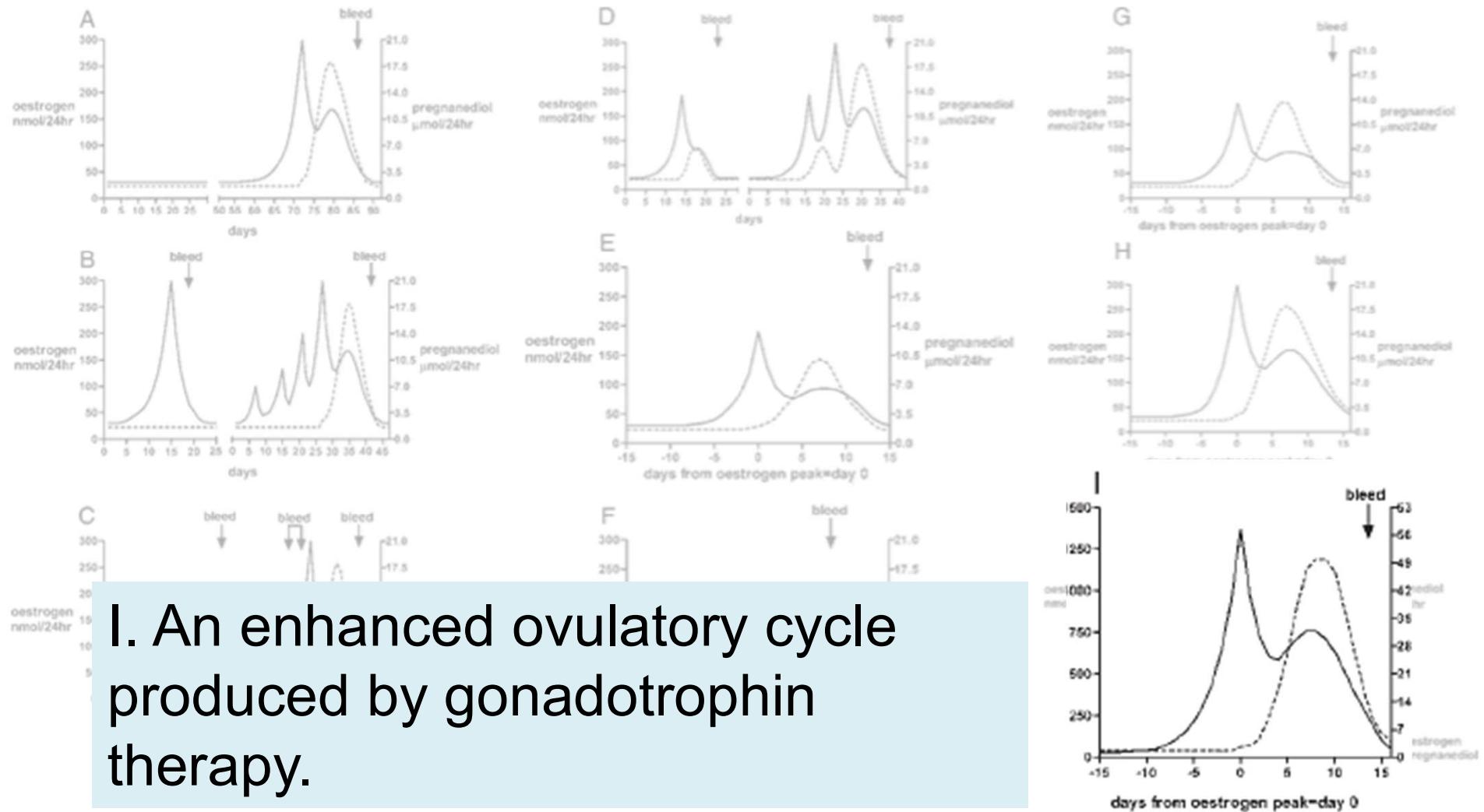
Ovulation followed by a short luteal phase of 10 day or less. The pregnanediol values exceed 13.5µmol/24hrs but fall prematurely. Menstruation followed.



# The Continuum and the Cycle Variants



# The Continuum and the Cycle Variants



I. An enhanced ovulatory cycle produced by gonadotrophin therapy.

# Hormone values and fertility and infertility

- Fertility is associated with marked daily changes in hormone output
  - Any pattern that shows no changes from day to day denotes infertility
- Achievement of pregnancy in the current cycle is proof that the cycle is fertile
  - The next best proof of ovulation is provided by the post-ovulatory rise in progesterone production following an estrogen peak and fall
- More than one ovulation day during a cycle has never been documented
- When ovulation occurs it is always followed after an interval by bleeding whether the luteal phase is normal, short or deficient, provided the woman is not pregnant and no abnormality exists
- The fertile ovulatory cycle with an adequate luteal phase is the only type of ovarian activity that can produce a continuing pregnancy

# The occasional cycle variant can occur in a healthy woman

At the beginning of her cycle  
a woman does not know how  
it will progress

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
wet	wet	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?		

# *Withstanding the Test of Time*

## Rules of the Billings Ovulation Method®

- Devised through clinical observations when Billings Ovulation Method® first developed
- Subsequent scientific validation and understanding has not required any changes to the Rules

# FOUR SIMPLE RULES

Early  
Day  
Rule 1

Avoid intercourse on days of heavy menstrual bleeding

Early  
Day  
Rule 2

You can have intercourse on alternate evenings of your Basic Infertile Pattern

Early  
Day  
Rule 3

When there is a change from your Basic Infertile Pattern, wait and see

**Peak  
Rule**

You may have intercourse at any time from the beginning of the fourth day after the Peak until your next menstruation

# FOUR SIMPLE RULES

# **Early Day Rule 1**

# No intercourse during heavy menstruation

Ovulation can occur as early as day 5  
Menstrual bleeding would obscure the beginning of  
the fertile phase

# FOUR SIMPLE RULES

**Early  
Day  
Rule 2**

Alternate evenings are available during the Basic Infertile Pattern

By confining intercourse to the evenings the Basic Infertile Pattern can be confirmed during the day

Seminal fluid and vaginal excretions tend to obscure any mucus on the day following intercourse

24 hours is sufficient for the seminal fluid to disappear and confirm the BIP is still present

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
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wet	wet	wet	dry spotting	wet spotting SF	dry	wet SF	dry	wet SF	no longer dry, sticky cloudy	wet cloudy	wet cloudy stringy	slippery clear stringy	slippery clear	slippery clear swollen vulva	dry	sticky opaque	sticky opaque	dry	dry	sticky cloudy	sticky cloudy	moist cloudy	moist cloudy	dry	dry	dry	dry	wet	wet					

# FOUR SIMPLE RULES

## Early Day Rule 3

Avoid intercourse on any day of discharge or bleeding which interrupts the Basic Infertile Pattern.

Waiting without intercourse when there is a change from the BIP allows the woman to observe whether this change proceeds to a Peak or in a return to the BIP

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
				• • I	• O • I	O	O	O	• • I	wet cloudy	wet clear stringy	slippery clear stringy	slippery clear	slippery clear swollen vulva	X 1	2	3																	
wet	wet	wet	dry spotting	wet spotting SF	dry	wet SF	dry	wet SF	no longer dry, sticky cloudy					dry	sticky opaque	sticky opaque	dry	dry	sticky cloudy	sticky cloudy	moist cloudy	moist cloudy	dry	dry	dry	dry	wet	wet						

# FOUR SIMPLE RULES

## Early Day Rule 3

Avoid intercourse on any day of discharge or bleeding which interrupts the Basic Infertile Pattern. Allow 3 days of the Basic Infertile Pattern afterwards before intercourse is resumed on the fourth evening. Early Day Rule 2 continues

Any change observed, which could include bleeding or spotting is due to raised oestrogen levels

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
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							1	2	3			1	2	3				1	2	3	1	2	3	1	2	3	1	2	3	1	2	1	2	

# FOUR SIMPLE RULES

**Early  
Day  
Rule 3**

Avoid intercourse on any day of discharge or bleeding which interrupts the Basic Infertile Pattern. Allow 3 days of the Basic Infertile Pattern afterwards before intercourse is resumed on the fourth evening. Early Day Rule 2 continues

If this change does not progress to Peak but returns to the BIP then allowing 3 consecutive days of BIP will enable the oestradiol to settle at low levels

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
								1	2	3			1	2	3				1	2	3														
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dry	wet	dry	dry	dry	dry	wet	wet	dry	dry	dry	dry	sticky	sticky	sticky	sticky	sticky	dry	dry	dry	dry	dry	wet	wet	wet	dry	dry									

# FOUR SIMPLE RULES

## Peak Rule

From the beginning of the fourth day following the Peak until the end of the cycle, intercourse is available every day at any time

Ovulation may occur on Peak or within the next 48 hours. The ovum can live for up to 24 hours. Channels in the cervix are still open for 3 days after the Peak allowing sperm entry into the uterus.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
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wet	wet	wet	wet	dry	wet SF		dry	wet SF	damp white	wet cloudy	wet cloudy	wet clear	slippery wet clear strings	slippery SV	dry creamy	dry creamy	dry creamy	wet SF	dry	mpist cloudy	moist cloudy	dry	dry	wet	wet	dry	dry	wet						

# FOUR SIMPLE RULES

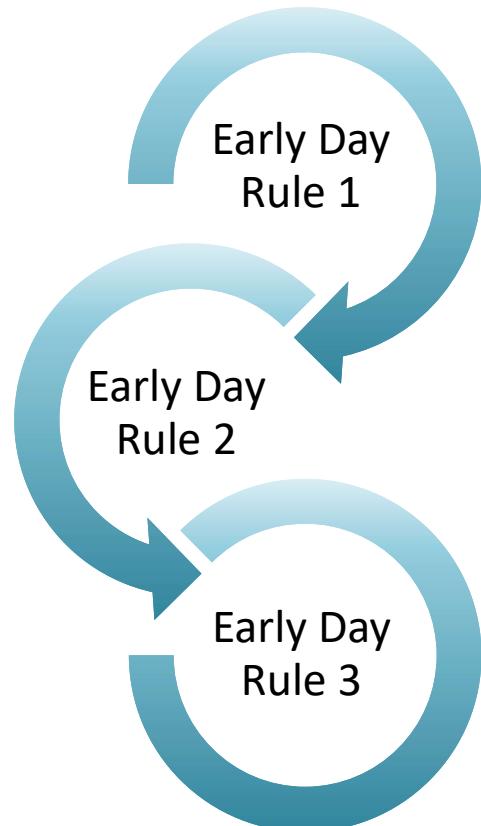
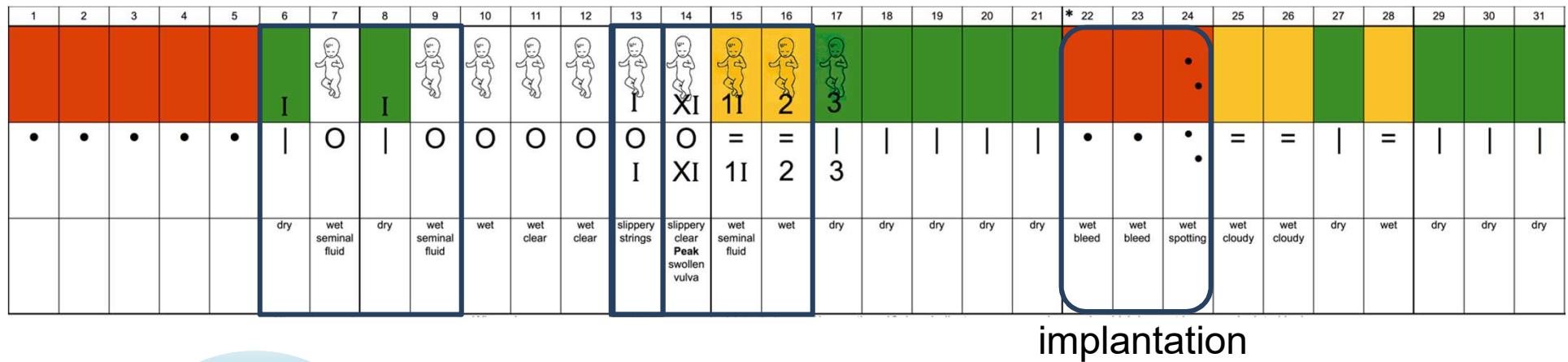
## Peak Rule

From the beginning of the fourth day following the Peak until the end of the cycle, intercourse is available every day at any time

By the end of the third day after the Peak the cervix is closed by the thick plug of G mucus and the ovum is dead. The fertile phase is over for this cycle.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
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wet	wet	wet	wet	dry	wet SF		dry	wet SF	damp white	wet cloudy	wet cloudy	wet clear	slippery wet clear strings	slippery SV	dry creamy	dry creamy	dry creamy	wet SF	dry	mpist cloudy	moist cloudy	dry	dry	wet	wet	dry	dry	wet						

# Achievement of Pregnancy



Postpone intercourse until the slippery sensation occurs

Intercourse should occur over days of the slippery sensation and the following one or two days

Australian Study shows a 63% pregnancy rate (240/384)



World Organisation of Ovulation Method Billings

# The Next Generation of Scientists

Already the next generation of scientists are “Asking the Right Questions” and so we understand more and more about the processes occurring in the menstrual cycle.

KISSPEPTINA

FSH



Estrogen



WOOMB™

World Organisation of Ovulation Method Billings

GnRH



Testosterone



DHEAS

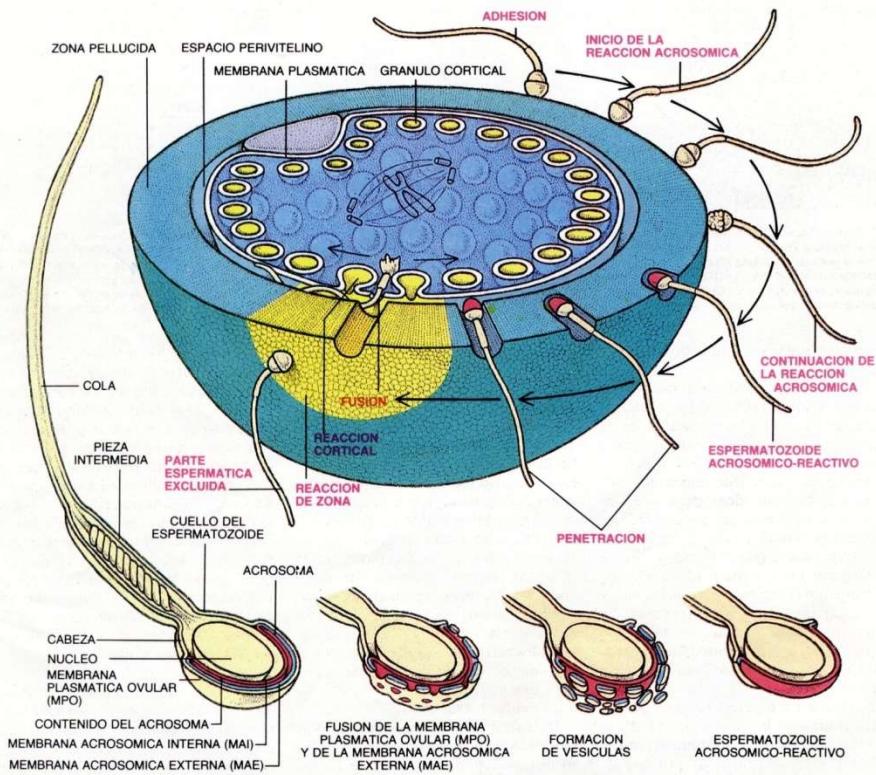


Leptin



Progesterone





## Acrosome Reaction

Polycystic ovary with several cysts

**PCOS**



## HYPOTHALAMUS

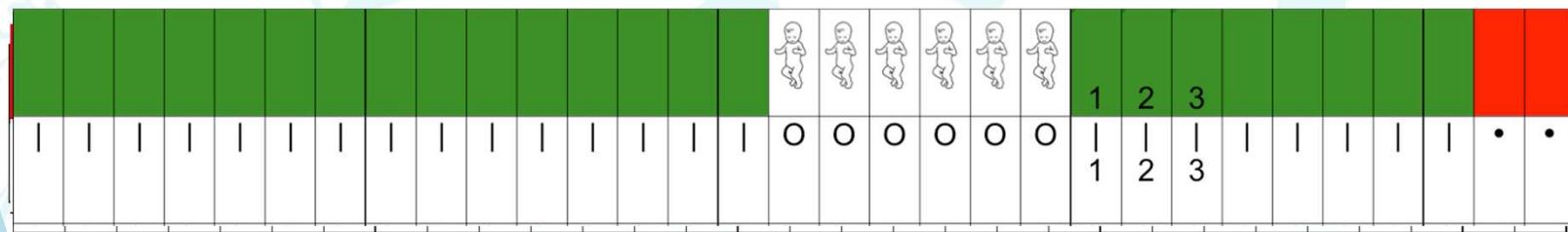
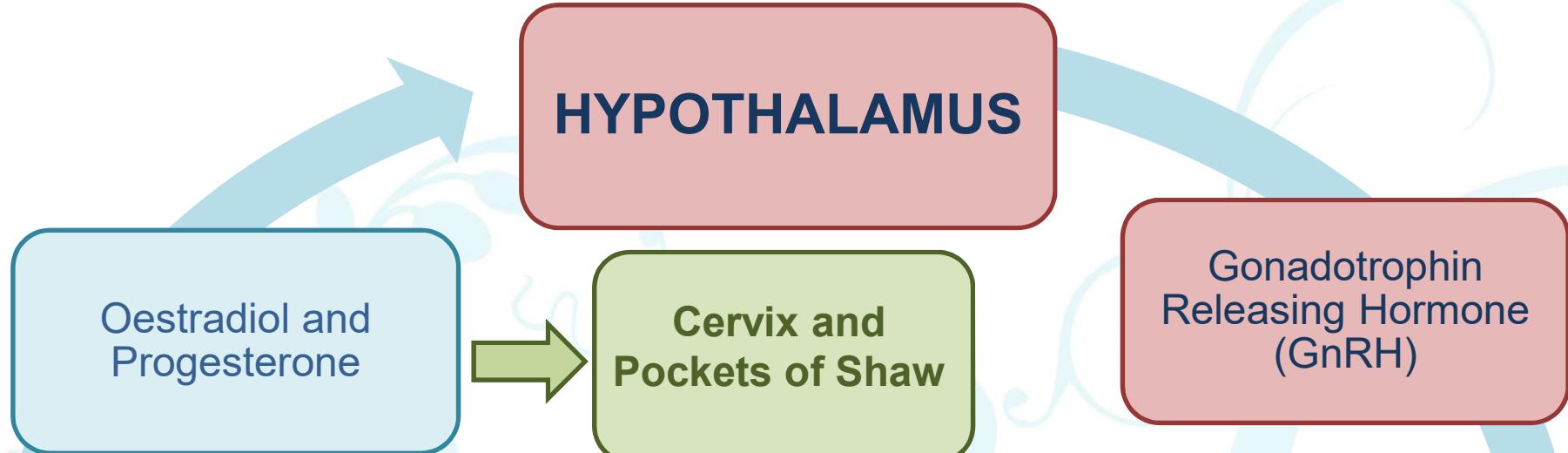
Oestradiol and Progesterone

Gonadotrophin Releasing Hormone (GnRH)

## OVARY

## PITUITARY

Follicle Stimulating Hormone (FSH) and Luteinising Hormone (LH)



# *A Story of God's Providence*



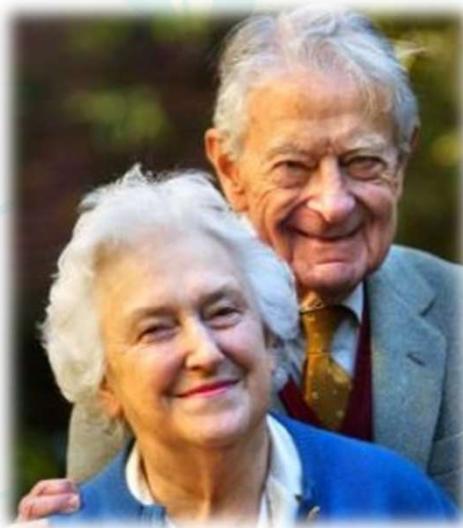
This Method is <sup>Achieve Pregnancy</sup> LOVE  
*Postpone or Avoid* Pregnancy



Diagnostic Benefits – Monitor Reproductive Health

*We Stand On The Shoulders Of Giants*

**Scientific Minds**



**Compassion**



**Humility**



**Faith**



# The Billings Ovulation Method® is scientifically sound

