

# GYNECOLOGY e OBSTETRICS

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## A LONGITUDINAL APPROACH

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Churchill Livingstone  
New York, Edinburgh, London, Madrid, Melbourne, Tokyo

**Library of Congress Cataloging-in-Publication Data**

Gynecology and obstetrics : a longitudinal approach / edited by Thomas R. Moore ... [et al.].

p. cm.

Includes bibliographical references and index.

ISBN 0-443-08811-X

1. Gynecology. 2. Obstetrics. I. Moore, Thomas R.

[DNLM: 1. Women's Health. 2. Pregnancy. 3. Genital Diseases, Female. WQ 200 G997 1993]

RG101.G937 1993

618—dc20

DNLM/DLC

for Library of Congress

93-10566

CIP

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Cover Design: *Jeanette Jacobs*

Printed in the United States of America

First published in 1993      7 6 5 4 3 2 1

# 11

## Fertility Control and Contraception

Michael A. Thomas

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The use of effective, reversible contraception allows sexually active couples to exercise control over their fertility. Indeed, approximately 90 percent of fertile couples will conceive within 1 year if no contraceptive method is used. A key role of women's health care providers is to provide patients with unbiased, objective information regarding the advantages and disadvantages of available contraceptive methods, taking into account the couple's individual social, religious, and political views. The patient's medical history and risk profile, both for unwanted pregnancy and undesired side effects of contraception, should be fully considered.

### FERTILITY AND CONTRACEPTIVE CHOICE

The fertility rate, or the number of live births per 1000 women of reproductive age (15 to 44 years), reached its peak in the United States in 1910 (127 per 1000 women). Subsequently there was a steady decline in childbearing until the "baby boom" period following World War II, when fertility rates again climbed upward, reaching a secondary peak in 1960 (118 per 1000 women). With the introduction of oral contraceptive pills (OCPs) during the 1960s, fertility rates began again to decline, a trend that has continued until the present. With a wider array of contraceptive choices (barrier, hormonal, and surgical), couples now have increased options in pregnancy prevention and therefore can better time the occurrence of desired conceptions. This freedom, combined with the increased numbers of women in the job force, have contributed to delayed childbearing and smaller families. The fertility rate presently is 65 per 1000 women.

According to a 1987 survey, of the 57.4 million

percent were at risk for pregnancy.<sup>1</sup> Only 93 percent of the women at risk ever use a form of contraception, with more unmarried than married women falling into this category. The combination OCP is the most commonly used single form of pregnancy prevention (32 percent of women). Female and male sterilization combined is used by 36 percent of the population, making it the most common form of fertility control. Condoms and vaginal barrier methods account for only 20 percent of users. However, barrier contraceptives are currently increasing in popularity and use because of the fear of acquired immunodeficiency syndrome (AIDS) and other sexually transmitted diseases. Use of the intrauterine device (IUD) has also increased as a result of the Food and Drug Administration (FDA)'s approval of a progesterone-containing device (Progestasert) and an improved copper-containing device (ParaGard). It is currently unclear what impact the newer subdermal methods (e.g., the implantable levonorgestrel system [Norplant]) will have on contraceptive use patterns, although its convenience and low failure rate have resulted in a high rate of acceptance.

### CONTRACEPTIVE EFFECTIVENESS

The ideal contraceptive agent would be one that is fully effective, easily reversible, free of both major and minor side effects, and acceptable to both partners and that has potential noncontraceptive health benefits and causes no reduction in fertility potential. Because no ideal contraceptive exists for a sexually active couple, the clinician must help delineate the potential benefits and disadvantages of a method or combination of methods that is most suitable for a particular couple's level of under-

**Actual and Theoretical Effectiveness**

The effectiveness of a contraceptive device is usually considered under two aspects, theoretical effectiveness and use effectiveness. The more important of the two, use effectiveness, measures failure rates in actual use, which always exceed those expected from the strictly theoretical effectiveness. Factors that may affect actual versus published rates include (1) individual motivation to use a method correctly and consistently; (2) the social, cultural, and economic background of the user; and (3) the degree of bias and level of competence of the investigators who planned and conducted the original effectiveness studies. Table 11-1 lists the lowest expected and typical failure rates during the first year of use of common hormonal and nonhormonal contraceptive agents.

**Counseling and Contraceptive Selection**

A woman's contraceptive needs may vary significantly over the course of her reproductive life. Contraceptive advice should therefore take account of the patient's individual situation. Effectiveness statistics used in counseling should be carefully and objectively determined from the literature and applied realistically. Data from the National Center for Health Statistics indicate that oral contraceptives are the most widely used form of contraception among women aged 15 to 34 years,<sup>2</sup> while among women aged 35 to 44 years, sterilization is most popular (Fig. 11-1).

There may be a tendency to overlook contraceptive issues in women 45 years of age or older, partly because of the increase in certain contraceptive complications and side effects in this age group. However, since the risk of pregnancy-associated mortality is sharply in-

Table 11-1. First-Year Contraceptive Failure Rates in the United States

Method	Lowest Expected (%)	Typical (%)
Chance	85	85
Withdrawal	4	18
Periodic abstinence		20
Calendar	9	
Ovulation method	3	
Symptothermal	2	
Postovulation	1	
Spermicides	3	21
Condoms	2	12
Sponge		
Parous	9	28
Nulliparous	6	18
Diaphragm	6	18
Cervical cap	6	18
Intrauterine device		
Progestasert	2	
ParaGard	0.8	
Contraceptive Pills		
Progestin only	0.5	
Combination	0.1	
Depot medroxyprogesterone acetate (Depo-Provera)	0.3	0.3
Norplant	0.04	0.04
Sterilization		
Women	0.2	0.4
Men	0.1	0.15

(Adapted from Trussell et al.,<sup>7</sup> with permission.)

creased in these patients (nearly 50 times greater for women 45 years or older and 10 times as great for women aged 40 to 44 years as compared with women aged 20 to 24 years), it is important that every menstruating woman be offered contraceptive counseling.

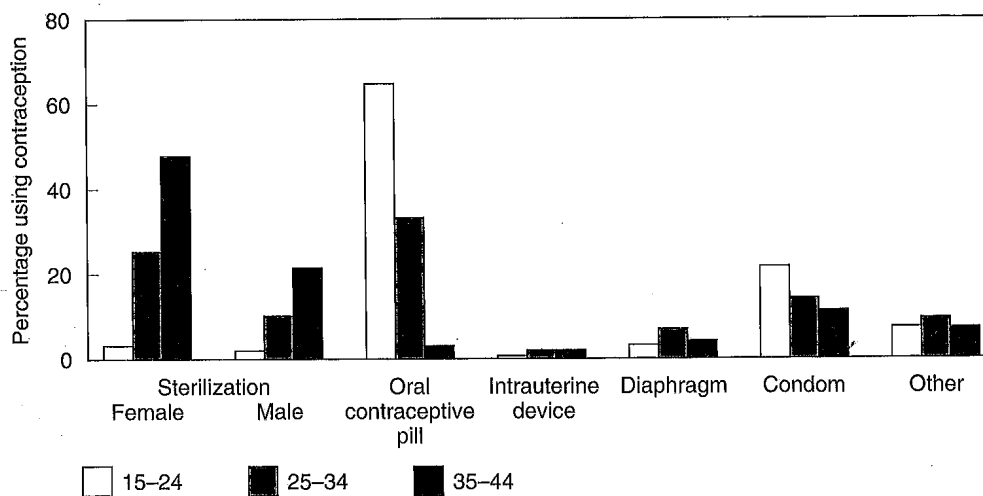


Figure 11-1. Contraceptive choices among sexually active women of various ages using contraception. (Data from Mosher and Pratt.<sup>2</sup>)

## CONTRACEPTIVE METHODS

### Natural Family Planning

#### Periodic Abstinence

Periodic abstinence methods, sometimes termed **natural family planning**, reduce fertility by abstention from sexual intercourse during the periovulatory period. This is accomplished by meticulously charting the menstrual cycle and observing certain physiologic changes that take place during the cycle (e.g., cervical mucus changes), from which the most likely time of ovulation is inferred. Charting methods include simple charting of the menstrual cycle (the so-called rhythm method), daily observations of basal body temperature (BBT) or cervical mucus, or a combination of these methods (symptothermal charting). All these methods of "fertility awareness" require a highly motivated couple willing to abstain from sexual intercourse for specific portions of the cycle.

Methods of periodic abstinence can be effective in preventing pregnancy, but in actual use the failure rate of such methods is high, owing to persistent risk taking and rule breaking, lack of motivation, dissatisfaction, or desire for another method.

A number of studies have suggested that periodic abstinence may incur a higher risk of spontaneous abortion and birth defects related to the time elapsed between ovulation and conception.

#### Calendar (Rhythm) Method

The calendar method is the oldest and most widely practiced form of natural family planning. Its effectiveness is predicated on the assumption that a woman's most fertile period occurs  $14 \pm 2$  days before her subsequent menses. Other variables that influence effectiveness of the rhythm method are sperm potency duration (up to 2 to 3 days) and oocyte survival (usually 24 hours). The earliest day of abstinence is calculated by subtracting 18 days from the length of the woman's shortest cycle; the latest day of abstinence is the length of her longest cycle minus approximately 11 days. For a typical 28- to 30-day cycle, the required abstinence period extends from day 10 to 19. It is clear, then, that use of the rhythm method is optimized by using baseline menstrual calendars for at least 8 months in predicting the expected lengths of the cycles.

#### Basal Body Temperature

Daily charting of basal body temperature (BBT) involves recording body temperature each morning upon awakening, the time when the temperature of a healthy individual is lowest. In order to reliably and prospectively predict the time of ovulation, three to four BBT calendars should be reviewed. Ovulation is signified by a subtle drop in BBT, which typically precedes ovulation by about 12 to 24 hours. This is followed by a sustained elevation in temperature ( $0.5$  to  $0.7^{\circ}\text{C}$ ) for several days, which is thought to be due to the influence of ovarian progesterone on the thermoregulatory center of the hypothalamus. Unfortunately, many factors can alter the typical biphasic pattern of the BBT, including illness, jet lag, and interrupted sleep.<sup>3</sup> Because of these atypical patterns and the fact that the rise occurs after ovulation, BBT monitoring alone is not the most accurate means of predicting ovulation.

#### Cervical Mucus

Immediately after menstruation, there is almost no cervical mucus evident at the external os. As the cycle proceeds, usually by cycle day 7 to 9, the mucus becomes cloudy, sticky, and somewhat more abundant. During the ensuing preovulatory phase, the cervical mucus thins under the influence of rising plasma levels of estradiol produced by the dominant follicle. Abstinence should begin in this period. As ovulation approaches (approximately on day 14), the mucus becomes clear, abundant, elastic, thin, and slippery, qualities that facilitate sperm penetration into the uterus. It is usually during this period that a ferning pattern can be observed when the mucus is spread on a microscope slide.

Physically, periovulatory mucus can be stretched between two slides to a distance of 6 cm or greater (spinnbarkeit). After ovulation, plasma progesterone levels rise, causing the mucus to thicken and become less penetrable by sperm; intercourse can resume approximately 4 days later. Factors that may hamper normal cervical mucus production and therefore interfere with the reliability of this method of natural family planning include intravaginal deposition of foreign substances (including semen), use of medications, and development of vaginal infections.

#### Symptothermal Charting

Symptothermal charting combines cervical mucus monitoring and BBT calendars. A detailed diary of these observations must be maintained. Periovulatory abstinence may be discontinued 4 days after peak elasticity in cervical mucus or 3 days following temperature elevation, which is later.



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