Contraceptive Method Mix

Guidelines for policy and service delivery

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Preface

The choice of contraceptive methods available to clients through a family planning programme — the contraceptive method mix — is an important determinant of programme success. Provision of an appropriate method mix together with good quality counselling to assist clients in method selection can help programmes to meet the varied reproductive health needs of their clients. They can also help programmes to achieve a high level of use of contraceptives (contraceptive prevalence). An increase in contraceptive prevalence will in turn lead to reduced fertility, which is associated with lower infant and child mortality as well as reduced maternal mortality. Reductions in unwanted fertility also lead to lower levels of induced abortion. Furthermore, by offering appropriate choices and good quality counselling, programmes can assist couples to determine freely the number and spacing of their children.

This publication provides a comprehensive analysis of the importance of contraceptive method mix to the achievement of programme goals. The issue of method mix is examined from the perspective of both the user, whose decision to use a particular method is based on a variety of personal, health, economic, and cultural factors, and programme personnel, whose decision to offer a particular method mix is based on factors such as policy, cost, and the availability of appropriate delivery systems. Detailed information on all currently available contraceptive methods is provided, as well as guidelines for proper client education and counselling, training and supervision of providers, introduction of new methods, and programme evaluation.

These guidelines are intended to assist family planning programme managers, administrators, and policy-makers in offering an appropriate method mix to their clients. Because each family planning programme operates within a unique environment, what is appropriate in one setting may be inappropriate in another. Readers are therefore encouraged to
use the information included in these guidelines in conjunction with their own knowledge and experience to develop the contraceptive mix most appropriate to the specific conditions and needs of their programme.

This publication is one of several produced by the World Health Organization, dealing with contraceptive technologies and the provision of services (see inside back cover). These publications synthesize the knowledge and experience of experts working in family planning and population research and programmes around the world.

The World Health Organization is particularly grateful to Dr Jacqueline Sherris and Ms Elisa Wells, of the Program for Appropriate Technology in Health (PATH), Seattle, WA, USA, for their assistance in the development of this guide. It also acknowledges the valuable contributions of the many experts who reviewed the various drafts as well as the participants in the informal working group that revised the text in Baltimore in 1991, namely: Dr Xiao Bilian, China; Dr Grace Ebun Delano, Nigeria; Dr Robin Hutchinson, Canada; Dr Kobchitt Limpaphayom, Thailand; Dr R. Magarick, United States of America; Dr Leila Mehr, WHO, Geneva; Dr Rebecca Ramos, Philippines; Dr Pramila Sennayake, United Kingdom; Dr M. Sabwa, United Nations Population Fund (UNFPA); and Dr J. Solis, Pan American Health Organization.

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Comments and queries on this publication should be addressed to: Family Planning and Population, Division of Family Health, World Health Organization, 1211 Geneva 27, Switzerland.
1. Contraceptive method mix: a component of reproductive health care for women

Family planning services should be viewed in the larger context of reproductive health care for women. The overall goal of any programme that addresses women's reproductive health issues should be to contribute to the improvement of the health and well-being of women. Provision of an appropriate contraceptive method mix is an integral component of a comprehensive reproductive health care programme. Ideally, other elements of such a programme should include provision of antenatal and postnatal care, treatment for sexually transmitted diseases (STDs), screening for cervical and breast cancers, treatment for infertility, safe abortion services (where legal), treatment for complications of abortion, and monitoring and treatment of other diseases, such as anaemia, that disproportionately affect women.

All reproductive health services should be of the highest quality possible. High quality contraceptive care involves providing women and men with safe and appropriate choices — programmes should provide a variety of types of methods to meet the different needs of different individuals and couples. It also involves giving men and women accurate and complete information about appropriate choices and allowing them to select freely a method that suits their needs. The careful screening of women for medical contraindications to contraceptive use is also a critical factor.

Providers of all reproductive health services should be aware that women often face special circumstances that may make it difficult for them to obtain the reproductive health care they need, even when it is seemingly available through a
specific programme. Some of these circumstances relate to the status of women in many parts of the world. For example, in many countries and cultures, women may be unable to obtain reproductive health care without consent from their husbands, or may be unable to make certain choices related to reproduction without the agreement of their husbands or other members of the family. In some instances, the threat of domestic violence that women may face further deters them from seeking care. In these circumstances, it is not difficult to imagine why a woman might be reluctant to seek assistance for an unwanted pregnancy or an STD. By recognizing and addressing the barriers to care that are unique to women, providers can help women to obtain the services they need.

Providers of reproductive health care services should try to ensure that the specific needs and concerns of their clients are addressed. Undertaking a qualitative evaluation of a programme can be a useful way of gathering information on people's perceptions of the services they need or have received (see Chapter 9). For example, focus group discussions with members of local community groups may reveal that women and men are reluctant to seek contraceptive services because the local clinic lacks a private area for counselling. Also of particular concern to many people is the safety of various contraceptives. Providers can use focus group discussions to identify specific concerns about the long-term effects of method use or how common contraceptive side-effects may affect individuals' health and well-being. Programme managers can use information obtained from these discussions and other sources to make changes that will enhance the acceptability of their programmes.

Summary

Individuals and couples need a broad range of reproductive health services; providing an appropriate contraceptive method mix is an important component of these services. All services provided should be of the highest quality possible. Providers of such services need to recognize and address the fact that women often face special circumstances that make it difficult for them to obtain care. Identifying and responding to women's concerns will help to ensure the quality of reproductive health care services, including the provision of an appropriate method mix.
2. The impact of method mix on contraceptive prevalence

Defining contraceptive method mix

The term “method mix” has been used to refer to both the menu of contraceptive choices available through a programme and the actual pattern of method use in the population. To avoid confusion about these related but different concepts, the term “method mix” is used in these guidelines to refer to the contraceptive options offered, and the term “method use pattern” is used to refer to the methods used in the population.

The method mix offered by a programme is based on factors such as national programme policy, availability of medical facilities and personnel, cost, provider bias, analyses of user preferences, age of the programme, and availability of donated commodities (see Chapter 5). The method use pattern that emerges when individuals select a method from among those offered depends on the method mix provided, on other programme factors (such as the extent of information provided about various methods and the quality of counselling) and on client needs and preferences (see Chapter 4). The overall prevalence of contraceptive use that results from a specific set of contraceptive choices to a large extent determines whether a programme succeeds or fails in reaching its demographic objectives. It has been clearly demonstrated that an increase in prevalence—either through increased acceptance or increased continuation—and greater use of more effective methods are linked to a decrease in fertility (Fig. 1). In addition, the method mix offered to clients can
have an important impact on client satisfaction, a factor that is crucial to continued programme success.

Patterns of method use

Contraceptive use worldwide

The number of contraceptive users worldwide was estimated to be 460 million in 1987, or approximately 51% of couples exposed to the risk of pregnancy. Specific method use was as follows:

- voluntary female sterilization 26%
- intrauterine devices (IUDs) 19%
- oral contraceptives 15%
- voluntary male sterilization 10%
- condoms 10%
- withdrawal 8%
- natural family planning methods 7%
Impact on contraceptive prevalence

- vaginal barrier methods 2%
- injectable contraceptives 1%
- other methods 2%

The patterns of method use in different parts of the world are illustrated in Fig. 2.

Fig. 2. Patterns of contraceptive use in different regions

![Pie charts showing contraceptive use in different regions](image)

Regional method use patterns

Contraceptive prevalence and method use patterns differ significantly from region to region, as shown in Fig. 2. Overall contraceptive use is much higher in developed than in developing regions (70% compared with 46%). Developed regions rely more heavily on oral contraceptives, condoms, and methods such as vaginal barrier methods and natural family planning than do developing regions, where there is a greater reliance on female sterilization and IUDs.

Contraceptive prevalence and method use patterns also vary considerably among developing regions. Overall use is highest in east Asia (including China) and Latin America, lowest in south Asia and Africa. East Asia relies heavily on female sterilization, male sterilization, and IUDs, whereas in Latin America the emphasis is on female sterilization and oral contraceptives, with virtually no male sterilization. Differences in method use patterns between regions can be attributed to programme factors (especially method availability) as well as client factors such as cultural preferences. For example, the low prevalence of condom use and vasectomy in many regions may result in part from a cultural bias against male methods.

Trends in method use patterns

In many countries and programmes, the pattern of method use has changed considerably over time (see Fig. 3). Some programmes offered a limited method mix to start with and then gradually expanded client options as it became more feasible to provide additional methods. For example, in the mid-1960s, IUDs were the most widely used method in the Republic of Korea. Oral contraceptives gradually gained acceptance in the late 1960s and sterilization, which was introduced in the early 1970s, became the most widely used method by the late 1970s. Changes in method use patterns over time can be caused by a variety of factors, including availability of methods, availability of medical facilities and skilled personnel, use of targets or incentives, use of campaigns to promote specific methods, and changes in user preferences.
Fig. 3. Trends in use of specific contraceptives in six countries

**Hungary 1958 - 1987**

**United States of America 1965 - 1982**

- Female sterilization
- Male sterilization
- Sterilization (Peru)
- Oral contraceptives
- IUD
- Condom
- Vaginal barrier
- Injectables (Thailand)
- Withdrawal (Hungary)
- Rhythm
- Other modern (Peru)
- Other
- Other traditional (Peru)

**Dominican Republic 1975 - 1986**

**Peru 1969 - 1986**

**Thailand 1969 - 1987**

**Republic of Korea 1966 - 1984**

The influence of changes on programme outcome

Although the impact of any programme is limited to some extent by the demand for family planning, decisions about the method mix offered and the quality of care provided can positively influence programme results, including user satisfaction, prevalence levels, and fertility rates. Statistical modelling of contraceptive use patterns suggests that programmes can increase their impact by (1) increasing the number of methods available to clients, and (2) providing appropriate, high quality care.

Offering more method choices

Experience suggests that, where logistically feasible, programmes should increase the number of choices offered to clients. Expanded method choice can lead to improved client satisfaction. It can also lead to increased prevalence (and ultimately to fertility decline) through increased acceptance, better continuation rates, and the use of more effective methods (Fig. 4).

Acceptance. Programmes that offer a broad variety of methods are likely to attract more acceptors than those that offer limited method choices, because the contraceptive needs of more groups of users will be met. This conclusion is supported by a recent analysis of the impact of contraceptive

Fig. 4. Effect of increased method choice on contraceptive prevalence and fertility

practice on fertility in developing countries. The analysis indicated that the biggest demographic impact of introducing a new method will come from attracting non-users rather than from users switching from another method (1).

The effect of method availability on contraceptive use has been further assessed using data from 36 developing countries (2). A multiple regression analysis, which controlled for the effect of socioeconomic development, indicated that making one additional modern method widely available could increase contraceptive prevalence by about 6%. On the basis of the observed relationship between crude birth rates and contraceptive prevalence, the corresponding reduction in birth rate would be about 2.5%. Fig. 5 illustrates the relationship between availability of modern methods and contraceptive prevalence in the 36 developing countries included in this analysis.

*Continuation.* An individual's continuation of contraceptive use and level of satisfaction with the programme are likely to increase as more methods become available. The availability of a variety of methods makes it

Fig. 5. Relationship between method availability and contraceptive use in 36 developing countries

possible for clients who are dissatisfied with one method to switch to another more acceptable method. This effect was demonstrated in the Matlab contraceptive distribution project in Bangladesh in which service providers encouraged dissatisfied clients to try another method. Although method-specific continuation rates were low, overall contraceptive continuation and prevalence were high, in part because of the availability of more method choices.

Making longer-acting, easy-to-use methods available can also contribute to increased continuation. For instance, contraceptives such as the IUD and the Norplant subdermal implant, once inserted, require little active involvement on the part of the user and thus generally have higher continuation rates than, for example, oral contraceptives and barrier methods, which require regular user involvement. Counselling clients about their decision can also improve continuation rates.

*Effectiveness.* Overall programme effectiveness can be increased by including more effective methods in the programme's method mix. Use of highly effective methods is likely to result in fewer unintended pregnancies. Therefore, increasing the proportion of clients using highly effective methods is likely to lower fertility and decrease the demand for abortion.

*Balancing acceptance, continuation and effectiveness to improve programme performance.* A good balance between increased contraceptive acceptance, continuation and effectiveness in a method mix will help to ensure that a programme successfully meets its goals as well as the needs of clients. For example, a programme that stresses increased acceptance through the use of incentive schemes but provides poor follow-up care, and thus has low continuation rates, may have many dissatisfied clients and little effect on overall contraceptive prevalence and fertility. Similarly, it is often counterproductive for programmes to set targets that are not derived from local conditions or for them to set method-specific targets for health workers. In contrast, a programme that promotes continuation by providing high quality service and follow-up to acceptors of highly effective methods may have a larger demographic effect, as well as satisfied clients who may informally promote the programme among friends.
Providing high quality care

High quality care is essential for programme success and for maintaining the health and satisfaction of clients. With respect to method mix, high quality care includes:

- providing a broad range of methods;
- providing complete and accurate information about all the methods offered;
- ensuring that providers have the technical skills necessary to provide the methods safely;
- ensuring that providers are trained in appropriate counselling techniques and use them effectively;
- ensuring that providers communicate with clients effectively and in culturally appropriate ways;
- providing follow-up care to ensure continuity of services;
- providing an adequate logistics system to ensure continuity of supply;
- providing convenient and acceptable services to clients;
- assessing and meeting the needs of clients.

High quality services can improve programme outcomes by increasing acceptance and continuation.

Acceptance. As mentioned above, increasing the number of choices available will lead to increased acceptance. Attention to the quality of other aspects of service delivery, such as education, counselling, and provider skill, will also increase acceptance. For example, a study of the effects of an information, education and communication (IEC) outreach programme on the method acceptance of Tunisian women found that women who received information from trained providers were more likely to accept a method than women who received no information; method acceptance increased by 125% in areas with IEC outreach compared with only 65% in areas where there was no such programme (3).

Continuation. High quality care promotes continuation. Informing clients about potential side-effects appears to be
especially important. For instance, among Indian women who were interviewed several years after receiving IUDs, continuing users were more likely to have received appropriate information on side-effects of IUD use than those who discontinued use (4). Continuing users were also more likely to have been given information on other methods (Fig. 6). A four-country study of Norplant acceptability suggested that many of the women who discontinued use because of side-effects would have continued using it if they had been adequately informed about what to expect (5).

Summary

The method mix offered by a programme can be an important determinant of method use patterns in a population. By expanding the number of methods available to users and improving the quality of care that clients receive, programmes can increase acceptance and continuation and encourage greater use of more effective methods. This will lead to higher contraceptive prevalence and, eventually, to lower fertility. Increasing choice and improving the quality
of care also benefit individual clients by giving them more control over their reproductive health. Clients who participate in programmes that offer choices and a high quality of care are likely to be satisfied contraceptive users. Before deciding to make changes in a programme’s method mix, programme managers, administrators, and policy makers should carefully consider all the factors involved in offering an appropriate choice of methods. The remaining chapters of these guidelines provide much of the information necessary to make such decisions.

Selected further reading


3. Contraceptive methods

Each contraceptive method has advantages and disadvantages. No single method is appropriate for all users, and some should not be used by certain groups owing to contraindications. In order to provide the most appropriate selection of contraceptive methods to family planning clients, it is important for programme administrators to be aware of the latest data on method effectiveness and safety. This chapter provides information on currently available contraceptive methods, which is summarized in Table 3, p. 42. Readers are referred to the WHO publications listed on the inside back cover for more comprehensive information on each of the methods.

**Measuring contraceptive failure**

The many different values for contraceptive failure presented in the literature are evidence of the difficulty that researchers face in quantifying the efficacy of different methods. Contraceptive failure rates are difficult to measure because both method and user characteristics contribute to failure. Study design is not standardized and results are often influenced by bias. Furthermore, because contraceptive use regimens may be more strictly adhered to in studies than in everyday use, failure rates reported in many studies may be lower than general failure rates.

The four most commonly reported indices of contraceptive failure are theoretical (method) failure, actual (use) failure, the Pearl index, and life-table rates. Only life-table rates control for the fact that, in general, failure rates decline with duration of use.
- **Theoretical or method failure** rates are reported as the percentage of women who would experience accidental pregnancy in the first year of use given perfect (correct and consistent) use. These rates are calculated by counting only those pregnancies that can be attributed to failure of the method itself. Any pregnancies that occur as a result of user error (non-use or risk-taking) are eliminated from the calculation. In many cases, these rates are unrealistically low.

- **Actual or use failure** rates are typically expressed as the percentage of women experiencing an accidental pregnancy in the first year of use. These rates are calculated by counting all pregnancies that occur while a couple is using a contraceptive method. Use failure has a subjective element which is dependent upon the user’s statement of whether or not contraception was in fact being used when the pregnancy occurred.

- **The Pearl index** is the number of accidental pregnancies per 100 woman-years of exposure. The Pearl index formula is:

\[
\text{Unintended pregnancies} \times 1200
\]

\[
\text{Total woman-months of exposure}
\]

The ratio can be deceptive to those not familiar with the index because it is based on a scale ranging from zero (if there are no failures) to 1200 (if all women studied became pregnant in the first month of the study).

- **Life-table** rates are expressed as the number of women who accidentally become pregnant in one year out of 100 women who started the method and continued to use it unless they became pregnant. These rates measure the proportion of contraceptive failures within a year and control for duration of use by calculating a separate failure rate for each month. Because life-table rates control for duration of use, they are the most reliable and consistent means of measuring failure.
Putting health risks in perspective

Although use of family planning clearly contributes to decreased maternal mortality and increased child survival, some women may be reluctant to adopt a contraceptive method because of fear of complications. Despite the fact that most methods carry only minimal risks, isolated incidents involving illness or death can often cause the escalation of rumours and misinformation about contraceptive methods in a community. Concerns about morbidity (illness) associated with contraceptive use can also prevent women from using some methods.

Providers should assure their clients that the mortality risk associated with any method is extremely low, especially when compared with the risks associated with pregnancy and childbirth (Fig. 7). The mortality risks associated with some methods, such as hormonal contraceptives, IUDs and voluntary sterilization, are derived mainly from the characteristics of the method, the health status of the client, and the risks associated with method provision. The risks associated with other methods, such as barrier methods and natural family planning, are encountered when the method fails and women are exposed to the risks of pregnancy and childbirth or abortion.

Because chronic or occasional illnesses can greatly interfere with a woman’s role within the family and community, the potential morbidity associated with contraceptive use can be of greater concern to women than the risk of mortality. Unfortunately, morbidity risks are difficult to measure and few studies have quantified the morbidity risks associated with contraception. In general, contraceptives protect women’s health; one study of contraceptive users in developed countries found that although a few people were admitted to hospital as a result of the use of IUDs, oral contraceptives, and male and female sterilization, many more hospitalizations were prevented by use of these methods (6). To minimize the risk of morbidity associated with method use, providers should carefully screen clients for contraindications and tell them to seek help immediately if they experience any adverse health effects.
Voluntary sterilization

Voluntary sterilization is the most widely used family planning method in the world and one of the most effective. It is also one of the most economical means of terminating
childbearing. Sterilization has the following benefits: it is permanent, highly effective, and relatively safe and does not require continuing conscious involvement on the part of the user. While both male and female sterilization procedures are highly effective, vasectomy is simpler, safer and usually less expensive.

It is important that programmes offering voluntary sterilization include thorough counselling that emphasizes that surgical procedures are appropriate only for people who do not want any more children and that provides information about the alternative contraceptives available. Although sterilization reversal techniques exist for both women and men, they are not readily available, are very expensive, have low success rates, and expose patients to unnecessary surgical risks. As a rule, couples choosing surgical contraception should not consider reversal as a future option.

**Male sterilization**

Voluntary male sterilization—vasectomy—is simpler, safer and usually less expensive than female sterilization. The vasectomy procedure involves minor outpatient surgery done under local anaesthesia in which one or two small incisions are made in the scrotum and the vasa deferentia are cut and tied or otherwise occluded to prevent the passage of sperm. It is highly effective, with a failure rate of 0.1–0.5% in the first year. Method failure is generally caused by spontaneous recanalization (reconnection) of the vas, occlusion of the wrong structure during surgery or, rarely, failure to detect a congenital duplication of the vas. Because sperm can still be found in the semen immediately after vasectomy, men undergoing vasectomies should be instructed to use another contraceptive method until a test shows that there are no sperm in the ejaculate or they have ejaculated at least 20 times.

Vasectomy can be performed without specialized medical facilities. When basic asepsis and standard surgical procedures are followed, mortality is extremely rare (about one death in 1 000 000 procedures) (6). Other complications, including infection, swelling, bleeding and haematoma, can be minimized by careful surgical technique and avoidance of strenuous activity for several days following the procedure.
Although vasectomy is commonly performed using one or two small incisions in the scrotum, a "no-scalpel" technique developed in China is now widely used there and in several other countries. The no-scalpel technique is almost bloodless and appears to reduce the incidence of complications from haematoma. After a local anaesthetic is injected, a specially designed ring forceps encircles and firmly secures the vas without penetrating the skin. A sharp-tipped dissecting forceps is then used to puncture the skin and vas sheath and stretch a small opening in the scrotum. The vas is lifted out and occluded as with other vasectomy techniques. The same midline puncture site is used to occlude the other vas. No sutures are needed to close the small wound which is covered with a small bandage. Another method of vasectomy, the vas occlusion technique, is currently being developed in China.

A variety of studies have been done to assess the long-term effects of vasectomy on the risk of cardiovascular disease, cancer, impotence (sexual dysfunction), prostatic disease, and disease related to immune function. To date, there are no proven long-term health effects of vasectomy. A few studies have suggested the possibility of a relationship between vasectomy and prostate cancer, but other studies have found no relationship, and methodological problems cloud the validity of the positive results. Other studies have looked at the possibility of a relationship between vasectomy and testicular cancer. Only one of these studies showed a possible association, but further research is necessary before generalizations can be made (7). Many men develop anti-sperm antibodies in the first year after vasectomy. Long-term studies of a number of conditions that could be related to antibody protection have so far failed to identify any adverse consequences.

Further information on vasectomy is available in the WHO publication *Technical and managerial guidelines for vasectomy services* (8).

**Female sterilization**

Voluntary female sterilization is accomplished by surgically occluding the fallopian tubes so that the egg and sperm cannot meet. The methods used for female sterilization vary according to the surgical approach used to reach the tubes, the timing of the procedure, and the procedure used to
occlude the tubes. Programme administrators should make decisions about which approaches and occlusion techniques to offer according to the needs and resources of their programmes. Making a wide range of female sterilization methods available will improve access and help to serve individual client needs.

Two approaches are commonly used to gain access to the fallopian tubes: (1) mini-laparotomy, which involves pulling the fallopian tubes through a small abdominal incision (2.5–5.0 cm); and (2) laparoscopy, which involves inserting a laparoscope into the abdomen, allowing the provider to see into the abdominal cavity and block the tubes. Both approaches are highly effective, with failure rates of less than 1 per 100 after one year. Female sterilization using either approach can be performed under local anaesthesia on an outpatient basis. Although complications such as wound infection, bowel injury, and bleeding can occur with either approach, female sterilization, with a mortality rate of 2–20 per 100,000 procedures, is considerably safer than childbirth (see box, p. 16).

Although equally effective, minilaparotomy and laparoscopy differ in several respects of interest to programme administrators. Minilaparotomy can be done with relatively simple and inexpensive surgical equipment by a properly trained provider who is familiar with basic surgical skills. It can be performed in any basic health facility with surgical and emergency back-up capacities and takes about 10–20 minutes to complete. Laparoscopy requires sophisticated and expensive equipment (which is difficult to repair and expensive to maintain), trained surgical specialists, and emergency back-up facilities. Laparoscopy should not be done on women who have had previous lower abdominal surgery or pelvic infections. Programme administrators should decide which approach to offer on the basis of caseload, programme, budget, availability of trained personnel and surgical facilities, and the need for diagnostic laparoscopy.

The second variable in female sterilization is the timing of the procedure. In the past, most female sterilization procedures were done soon after delivery. New technologies and refinements in surgical technique have expanded the possibilities for the timing of the procedure and thus greatly improved the availability and acceptability of this method.
The sterilization procedure can be done at most times during a woman's reproductive life, including shortly after a vaginal delivery, in conjunction with a caesarean section, following a non-septic abortion or miscarriage, or when the woman has not recently been pregnant (interval period). Because of a higher risk of complications, sterilization procedures are not usually performed from one to six weeks after delivery or during pregnancy. The timing of the procedure affects the choice of the surgical approach; laparoscopy is only recommended for interval procedures whereas minilaparotomy can be used at any time.

The third variable in the sterilization procedure is the method of occlusion used. The three most common methods of occlusion are: (1) ligation and division (done only with a minilaparotomy approach); (2) mechanical occlusion (clips and bands); and (3) electrocoagulation. All are associated with low failure rates—again approximately 1%. The Pomeroy technique, in which a segment of the fallopian tube is tied in a loop and then the top portion of the loop is cut and removed, is the most common method of ligation. Mechanical occlusion can be done either via minilaparotomy or laparoscopy. Electrocoagulation is generally performed using a laparoscopy approach. However, the use of electrocoagulation is no longer recommended by WHO as, particularly with inexperienced providers, it can cause internal burns and is believed to lead to higher rates of ectopic pregnancy. When possible, methods that minimize damage to the tubes should be used: clips cause the least damage to the tubes, followed by silicone rubber bands (small, round, elastic bands placed over a loop of the fallopian tube), Pomeroy ligation, and electrocoagulation.

Additional information on the various approaches and procedures for female sterilization is available in the WHO publication, *Female sterilization* (9).

**Intrauterine device**

The intrauterine device (IUD) is a highly effective, safe, reversible means of preventing pregnancy for selected women, particularly those who are not exposed to STDs and have already borne children. IUDs are small plastic or metal devices that are inserted into the uterus through the cervical
canal. Although the precise mechanism of action is not known, it is hypothesized that the IUD interferes with sperm motility and ovum transport. Recent research suggests that the IUD’s main mode of action is in the prevention of fertilization, thus contradicting the widely held belief that IUDs act as abortifacients (10). When inserted postcoitally, however, IUDs can act as abortifacients (see pages 41–42). IUDs can be successfully inserted by trained health workers.

IUDs are of two types: medicated and non-medicated. Medicated IUDs currently in use include two hormone-releasing models, which are available in only a few countries, and models that contain copper (Copper T 380A, Copper T 200, Copper T 220C, Multiload 375, Multiload 250, and Nova T). Non-medicated IUDs now in use are the Lippes loop and the single and double stainless steel ring.

The effectiveness of IUDs is influenced by the characteristics of the device, provider skill (in inserting the device), and user characteristics (such as age and parity). A study that pooled results from large international multicentre randomized IUD trials showed the following one-year Pearl pregnancy rates per 100 women (11):

- Progesterone-releasing 0.2
- Copper T 380A 0.5
- Multiload 375 0.6
- Copper T 220C 0.9
- Nova T 1.2
- Multiload 250 1.7
- Copper T 200 2.5
- Lippes loop D 2.8
- Double stainless steel ring 3.3

A study of method failure in 15 developing countries found an average first-year IUD failure rate of 4.0%; failure rates ranged from 1.1% in Morocco to 13% in Brazil (12) (see box, p. 24). Effectiveness of the IUD is not dependent on regular involvement of the user.

In addition to high effectiveness rates, most IUDs have high continuation rates: between 70% and 90% after one
year in large multicentre trials. With the exception of the progesterone-releasing model, which must be replaced every year, the approved life-spans of modern medicated IUDs vary from three to eight years, although there is clinical evidence that the copper T 380 A is effective for up to ten years.

The unfavourable reputation of IUDs in some countries should be reviewed in light of recent research addressing safety issues. One of the primary concerns about the IUD has been its relationship to pelvic inflammatory disease (PID). Recent studies have shown that increased incidence of PID occurs almost exclusively in the first four months after insertion and among women who are exposed to STDs. Careful screening of potential IUD users can minimize complications related to PID. Women who have been or are likely to be exposed to STDs, by having either multiple sex partners or a single partner who has multiple sex partners, should be referred to other methods. Education about the symptoms of PID can also help reduce complications by encouraging women to seek early treatment.

New research has also addressed the relationship between ectopic pregnancy and IUD use. Although it had been thought that IUD use increased the risk of ectopic pregnancy, accumulated data now indicate that, while IUD users are more likely than users of some other contraceptives to experience an ectopic pregnancy, they are 50% less likely to experience ectopic pregnancy than women not using contraceptives. Copper-containing IUDs carry the lowest risk of ectopic pregnancy while the progesterone-releasing IUD carries the highest risk: 0.3 per 100 woman-years of use for the copper T 380A compared with 5.0 for the progesterone-releasing IUD.

A new area of concern is whether IUD use increases susceptibility to human immunodeficiency virus (HIV) infection. Although one study of prostitutes showed an increased HIV seroconversion rate among IUD users (13), more research is needed to clarify this issue.

A commonly experienced side-effect associated with both medicated and non-medicated IUDs is increased volume of menstrual bleeding per cycle. In addition to being inconvenient for users and a possible reason for discontinuation, this may present a health risk to users, particularly in areas where anaemia is endemic. The increased blood loss is most
Contraceptive method mix

pronounced in users of non-medicated IUDs: blood loss has been shown to increase from a mean of 32 ml in women not using contraceptives to 52–72 ml in Lippes loop users 24 months after insertion. Copper-containing IUDs cause a less pronounced increase and progesterone-releasing IUDs actually reduce menstrual blood loss to 9–13 ml one year after insertion. Counselling to ensure that women are prepared for probable changes in menstrual patterns with IUD use is important.

Combined oral contraceptives

Combined oral contraceptives use synthetic estrogen and progestogen to prevent pregnancy. Taken daily, the hormones act to inhibit ovulation, alter the endometrial lining, and impair sperm passage into the uterus by thickening the cervical mucus. When administered in a specific postcoital regimen, oral contraceptives can also act to prevent implantation of a fertilized egg (see page 41). In recent years, use has shifted from standard-dose pills (containing 50 μg or more of estrogen) to low-dose pills (containing 30–35 μg of estrogen); low-dose pills account for

Contraceptive failure in developing countries

Recent research on contraceptive failure rates in 15 developing countries indicates that average first-year failure rates for oral contraceptives, IUDs, rhythm, and withdrawal are generally comparable to those in developed countries but vary considerably within and between regions. The major difference between developing and developed country failure rates is in the relative efficacy of oral contraceptives and IUDs; in contrast to developed countries, in developing countries the average first-year failure rate for oral contraceptives (6.8%) is higher than that for IUDs (4.0%) (12). Average first-year failure rates for rhythm (19.3%) and withdrawal (16.3%) are comparable to developed country rates.

The method-specific failure rates reported, which were calculated using demographic and health survey data, varied considerably within and between regions (see table opposite). This variation may be due to methodological problems or to differences in the consistency of use among various populations.
First year probability of contraceptive failure (%), by country and method

<table>
<thead>
<tr>
<th>Country</th>
<th>Oral contraceptives</th>
<th>IUD</th>
<th>Rhythm</th>
<th>Withdrawal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Latin America</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bolivia</td>
<td>10.5</td>
<td>3.0</td>
<td>21.2</td>
<td>34.8</td>
</tr>
<tr>
<td>Brazil</td>
<td>5.4</td>
<td>13.0</td>
<td>22.8</td>
<td>20.7</td>
</tr>
<tr>
<td>Colombia</td>
<td>7.7</td>
<td>5.3</td>
<td>24.8</td>
<td>20.1</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>11.8</td>
<td>3.6</td>
<td>19.9</td>
<td>29.2</td>
</tr>
<tr>
<td>Ecuador</td>
<td>5.8</td>
<td>4.6</td>
<td>13.9</td>
<td>27.2</td>
</tr>
<tr>
<td>Guatemala</td>
<td>9.8</td>
<td>7.7</td>
<td>24.6</td>
<td>12.0</td>
</tr>
<tr>
<td>Mexico</td>
<td>5.4</td>
<td>1.5</td>
<td>3.7</td>
<td>4.0</td>
</tr>
<tr>
<td>Peru</td>
<td>5.9</td>
<td>4.2</td>
<td>23.6</td>
<td>17.3</td>
</tr>
<tr>
<td>Trinidad and Tobago</td>
<td>5.9</td>
<td>4.2</td>
<td>13.7</td>
<td>17.6</td>
</tr>
<tr>
<td><strong>Asia</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td>2.7</td>
<td>1.9</td>
<td>10.8</td>
<td>8.5</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>7.2</td>
<td>3.4</td>
<td>13.0</td>
<td>11.5</td>
</tr>
<tr>
<td>Thailand</td>
<td>2.8</td>
<td>2.5</td>
<td>14.8</td>
<td>7.4</td>
</tr>
<tr>
<td><strong>North Africa</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Egypt</td>
<td>6.9</td>
<td>1.8</td>
<td>38.4</td>
<td>10.3</td>
</tr>
<tr>
<td>Morocco</td>
<td>8.6</td>
<td>1.1</td>
<td>30.5</td>
<td>11.5</td>
</tr>
<tr>
<td>Tunisia</td>
<td>5.4</td>
<td>2.7</td>
<td>14.2</td>
<td>12.5</td>
</tr>
</tbody>
</table>

Over 85% of oral contraceptives sold in developed countries and almost 60% of those sold in developing countries. Triphasic oral contraceptives, a type of low-dose pill, have become popular in some areas following marketing claims that they are equally effective but may cause fewer metabolic effects and be more effective than most other low-dose oral contraceptives. However, available data do not support these claims of greater safety and acceptability.

Low-dose pills cause fewer adverse side-effects than higher-dose pills while maintaining a high rate of effectiveness. Effectiveness is dependent upon the woman's ability to
take a pill every day. Clinical trials of low-dose oral contraceptives have demonstrated theoretical failure rates of 1% in the first year; a typical first-year failure rate for low-dose pill users in developed countries is 3%. The average first-year failure rate for oral contraceptives in a study in 15 developing countries was 6.8%; failure rates ranged from 2.7% in Indonesia to 11.8% in Bolivia (12). Higher failure rates in developing countries probably result from irregular pill-taking; providers should give women clear instructions about when to start the next pill pack and what to do when a pill is missed (see box, p. 28).

In addition to their contraceptive effect, combined oral contraceptives have several non-contraceptive health benefits (see box below). Despite this, much of the public awareness of oral contraceptives has centred on real or perceived health risks to the user. A survey of women in eight developing countries found that many women believed that oral contraceptives caused sterility, birth defects, and uterine cancer—all incorrect beliefs (14). In contrast, few women knew that oral contraceptives could adversely affect a woman’s ability to breast-feed or increase the risk of stroke. The real risks of oral contraceptive use relate primarily to cardiovascular diseases and, perhaps, some types of cancer.

**Some methods have non-contraceptive health benefits**

In addition to providing protection from pregnancy, some methods provide users with non-contraceptive health benefits. For example, barrier methods help to protect users against some STDs, including infection with HIV, the virus that causes AIDS. Barrier methods also help to prevent cervical cancer. Oral contraceptive users are less likely to develop benign breast cysts, recurrent ovarian cysts, iron deficiency anaemia, endometrial and ovarian cancers, and some forms of PID than women not using contraceptives. In addition, oral contraceptives may decrease the amount of monthly bleeding and cramping, an important benefit to women with heavy or painful menstrual periods. Implants and injectables may also decrease menstrual bleeding; this effect is particularly important to women’s health in areas where anaemia is endemic. While a method’s contraceptive characteristics should be the primary reason for its selection by a client, providers should also inform clients about non-contraceptive benefits.
The primary known adverse effect of oral contraceptive use is increased risk of cardiovascular system diseases, including thromboembolism, stroke, hypertension, heart attack, and atherosclerosis. The magnitude of associated cardiovascular risks is difficult to determine, since much of the data acquired to date are based on experience with higher-dose rather than low-dose pills. In general, however, for non-smoking women who have no risk factors for cardiovascular disease, the health risks associated with use of the currently available low-dose oral contraceptives are very small and are significantly less than those associated with childbirth.

Data from developed countries have shown that use of oral contraceptives protects against ovarian and endometrial cancer but may be associated with an increased risk of breast and cervical cancers. A recent WHO multicentre study, which gathered data from eight developing and three developed countries, found that the results of most studies of oral contraceptive use and cancer risk from developed countries are applicable to women in developing countries (see Table 1). One interesting result of the WHO study was that in developing countries, use of oral contraceptives was not associated with an increased risk of liver cancer, as it has been in developed countries (15).

The relationship between oral contraceptive use and breast and cervical cancers remains unclear. Recently published data suggest that long-term users who began use when they were young and before their first child was born may be at greater risk of developing breast cancer. While use of oral contraceptives is generally found to be associated with cervical cancer, it is often difficult to separate the effects of the contraceptive from the effects of sexual behaviour and other risk factors. Although available data do not warrant a change in prescription requirements or labelling, as new studies are done they will be reviewed and appropriate action taken.

Probably the biggest concern to many users of oral contraceptives is the side-effects they experience, especially in the first few months of use. These include irregular menstrual bleeding, nausea, mood changes, headaches, skin changes (chloasma), decreased sex drive, decreased vaginal lubrication, and an increased incidence of cervical ectropion (a condition that can increase risk of cervical infection).
Instructions for users of oral contraceptives

Providers should give the following simple instructions to users of oral contraceptives.

Starting the pill
The woman should start the first cycle of pills within the first five days of her menstrual period. If a woman wishes to start on a particular day of the week, and that day is beyond the fifth day of her menstrual cycle, she should be advised to use additional protection against pregnancy for seven days after she starts the pill.

Management of missed pills
- If one pill is missed, the pill should be taken as soon as the woman remembers.
- If two pills are missed in the first two weeks, the woman should take two pills on two consecutive days and then continue with the rest of the pack as usual.
- If two pills are missed in the third week, of if more than two are missed consecutively at any time in the cycle, the woman should discard the pack and start a new one immediately.

Whenever pills are missed, another contraceptive method (barrier or abstinence) should be used for a minimum of one week to secure additional protection.

Additional advice
Whenever possible, service providers should ensure that the supplies given to the woman allow her to have an extra pack of pills always available. It is also good practice to provide the woman with a supply of condoms when she is given her first packs of pills in case she needs additional protection. (Many experts suggest that women should also be told to use condoms in addition to oral contraceptives if they may be at risk of acquiring an STD, including HIV infection.)

Many of these effects diminish after several months or can be managed by changing to a different dose regimen. Adequate counselling of women starting to use oral contraceptives, including explanation of possible side-effects, is important.

Progestogen-only methods

A number of progestogen-only methods are in use or being tested worldwide. Progestogens used in these methods
### Table 1. Relative risks of six cancers in women who have ever used oral contraceptives

<table>
<thead>
<tr>
<th>Type of cancer</th>
<th>WHO study(\text{a})</th>
<th>Summary results from other case-control studies(\text{c})</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All countries</td>
<td>Developing countries</td>
</tr>
<tr>
<td>Endometrial</td>
<td>0.5 (0.3, 0.7)</td>
<td>0.5 (0.2, 1.2)</td>
</tr>
<tr>
<td>Ovarian</td>
<td>0.75 (0.6, 1.0)</td>
<td>0.8 (0.5, 1.1)</td>
</tr>
<tr>
<td>Breast</td>
<td>1.15 (1.0, 1.3)</td>
<td>1.2 (1.1, 1.5)</td>
</tr>
<tr>
<td>Cervical(\text{g})</td>
<td>1.2 (1.0, 1.4)</td>
<td>NC(\text{h})</td>
</tr>
<tr>
<td>Liver</td>
<td>0.7 (0.4, 1.2)</td>
<td>NC</td>
</tr>
<tr>
<td>Gallbladder</td>
<td>0.6 (0.3, 1.3)</td>
<td>NC</td>
</tr>
</tbody>
</table>


\(\text{a}\) Figures in parentheses give 95% confidence intervals.


\(\text{c}\) Summary relative risk values based on 5 studies for endometrial cancer, 10 for ovarian cancer, 16 for breast cancer, 3 for cervical cancer, and 3 for liver cancer. These studies were conducted almost exclusively in developed countries. From Prentice RL, Thomas LDB. On the epidemiology of oral contraceptives and disease. *Advances in cancer research*, 1987, 49: 285-401, except relative risk for cervical cancer, which was calculated for this table.

\(\text{d}\) Israel and Australia.

\(\text{e}\) Israel only.

\(\text{f}\) Israel, Australia, and the German Democratic Republic.

\(\text{g}\) Invasive disease only.

\(\text{h}\) Relative risks for all countries reflect primarily developing country data.

\(\text{i}\) NC = not calculated; NA = not available.
include levonorgestrel, medroxyprogesterone acetate, and norethisterone. Progestogen-only methods protect against pregnancy by thickening cervical mucus, changing the endometrium (making it inhospitable to implantation), and often inhibiting ovulation. Progestogen-only methods may eliminate some of the risks associated with estrogen (such as increased risk of thromboembolic and cardiovascular disease) and are appropriate hormonal methods for lactating women. Limited research has shown no adverse effect on children whose mothers used progestogen-only methods while breast-feeding.

While the major side-effect of progestogen-only methods is irregular bleeding, the total amount of blood loss generally remains the same and, in some cases, haemoglobin levels have been shown to increase over time. Users of progestogen-only methods may experience prolonged bleeding, more frequent bleeding, less frequent bleeding, or periods of amenorrhoea. Because of this bleeding irregularity, counselling of women using progestogen-only methods about the potential changes in their menstrual cycles is important for method continuation.

This section covers only methods currently in use. Other hormonal methods under development that may be available in the future include levonorgestrel implants (12-month regimen), norethisterone injectable microspheres (3-month regimen), and hormone-containing vaginal rings.

Minipills

A less widely used form of oral contraceptive, the progestogen-only “minipill” does not contain estrogen and is slightly less effective than combined oral contraceptives: the lowest expected pregnancy rate is 0.5 per 100 woman-years and clinical trial failure rates range from 1 to 3 per 100 woman-years of use. Effectiveness of the minipill is dependent upon a woman’s ability to take a pill daily; a missed minipill is more likely to result in pregnancy than a missed combined pill. Users who are three or more hours late in taking a minipill should use a back-up method for seven days. Minipill users have a higher risk of ectopic pregnancy than do users of combined oral contraceptives, but this risk is still lower than that in women who do not use contraceptives.
Norplant

Norplant, a subdermal implant system that provides up to five years of contraceptive protection, consists of six silicone rubber capsules (each containing 36 mg of levonorgestrel) that are inserted under the skin of the woman's arm. The capsules release an average of 50 μg of levonorgestrel per day during the first year of use; this level drops to 30 μg per day in subsequent years. Norplant implants have now been used by almost 2 million women in 25 countries with regulatory approval. Several other subdermal implant systems with varying periods of effectiveness are currently under development.

Overall, the pregnancy rate in Norplant users is 0.2 per 100 women in the first year of use, with a cumulative pregnancy rate of 3.9 per 100 women by the fifth year. Effectiveness of Norplant is not dependent upon regular involvement of the user. It is correlated to weight, however: five-year pregnancy rates per 100 women are 0.2 for women weighing less than 50 kg, 3.4 for women of 50–59 kg, 5.0 for women of 60–69 kg, and 8.5 for women over 70 kg. Continuation rates are high, with 87–95% of women still using the method after one year and 42–78% using the method for the maximum recommended period of five years. The capsules can be removed at any time by a trained medical provider and, in one study, 86% of women were able to conceive within one year after discontinuation (16).

Because widespread use of Norplant is relatively recent, information about the long-term safety of the method is limited to data collected from clinical trials. The ectopic pregnancy rate among Norplant users (1.3 per 1000 woman-years) is similar to that among users of copper and non-medicated IUDs and lower than that for women not using contraceptives. There is currently no evidence of increased cardiovascular disease among users. It must be stressed that ongoing research, including post-marketing surveillance, will provide further information on the safety and long-term effects of Norplant use. Although not a problem to date, potential difficulties with removal of the implants may become evident as more women require removal services. Women who do not have the implants removed after five years face a higher risk of pregnancy, because the method gradually becomes less effective as the amount of
Progestogen in the capsules is depleted. As the risk of pregnancy increases, so does the risk of ectopic pregnancy, a potentially life-threatening condition.

Some women using Norplant experience side-effects. The most frequently reported side-effect is a change in menstrual bleeding patterns, including prolonged menstrual bleeding during the first few months of use, bleeding or spotting between periods, amenorrhoea, or a combination of these. Occasionally, an infection may occur at the site of implantation. Other reported side-effects that may be method-related include headache, nausea, dizziness, acne, weight gain, breast tenderness, growth of facial hair, and functional ovarian cysts. These side-effects usually diminish over time. Informing women that these effects may occur during the first few months after insertion is very important. It is also important to inform women that Norplant must be removed after five years (or sooner, if desired) and to tell women where removal services are available. A new set of implants may be inserted for continued protection.

Additional information on Norplant is available in a WHO document (17).

**DMPA and NET-EN injectables**

Two long-acting injectable contraceptives—depot-medroxyprogesterone acetate (DMPA) and norethisterone enantate (NET-EN)—have been approved for use in 90 and 40 countries, respectively. In addition to being convenient and not coitus-dependent, the methods are highly effective: the failure rate for DMPA (three-monthly injectable) is less than 1 per 100 woman-years, for NET-EN (two-monthly injectable) less than 2 per 100 woman-years. Effectiveness is dependent upon a woman’s ability to return to a service provider for injections at regular intervals. DMPA injections should not be given less than 11 weeks or more than 14 weeks after the previous injection. Both DMPA and NET-EN produce amenorrhoea in many users. This effect is seen as a disadvantage by many women who consider regular bleeding a sign of health and use menstruation as an indicator that they are not pregnant. Although return to fertility following discontinuation can be delayed for 6–12 months, studies suggest that 60–78% of women conceive within one year of the last injection.
There has been some concern over the safety of injectables
and, in the past, considerable controversy has surrounded
the use of DMPA. In laboratory studies, animals injected
with high doses of DMPA developed benign and malignant
tumours of the breast (beagle dogs) and endometrium (rhesus
monkeys). There is, however, no conclusive evidence to
suggest that a similar effect occurs in humans taking much
lower doses. When given to beagle dogs, DMPA produces
hormonal changes not seen in humans under conditions of
normal use of the drug. The findings from these studies with
respect to risk of breast cancer thus appear not to be
generalizable to humans.

Two epidemiological studies have provided useful
information on the risk of breast cancer in users of DMPA.
The first was a population-based case-control study in New
Zealand (18), while the second was a hospital-based case-
control study coordinated by WHO with data from three
countries (Kenya, Mexico and Thailand) (19). Neither of these
studies found any increased overall risk of breast cancer in
women who had ever used DMPA. Slightly to moderately
elevated risks in some subgroups, such as women under 35 years
and recent users of DMPA, were observed in both studies.
Although the patterns of elevation in risk are difficult to
interpret, they would be consistent with earlier detection of
pre-existing cancer. While other interpretations are possible,
the findings from these two studies are not compatible with
the notion that DMPA is a cancer-initiating agent (20).

Findings from studies of DMPA and invasive cervical
cancer are also generally reassuring: in none of the studies
undertaken to date was there a consistent pattern with
duration of use or with other time-related factors (20). These
findings are not supportive of an association between DMPA
and cervical cancer. The results of a recent study (21) suggest
that bone density may be reduced in long-term users of
DMPA. However, no firm conclusions can be drawn since
the study involved only a small number of subjects and
lacked data on bone density before DMPA use. There is
good evidence that use of DMPA provides protection against
endometrial cancer. Use of DMPA appears not to be
associated with either increased or decreased risk of ovarian
cancer. A recent WHO meeting did not recommend restric-
tions on use of DMPA as a contraceptive on the grounds of
risk of neoplasia (20).
No evidence of adverse effects on the cardiovascular system has been demonstrated. Further research is needed on these issues. The ongoing analysis of the WHO Collaborative Study on Steroidal Contraceptives and Neoplasia will provide more data on the safety of DMPA.

Additional information on long-acting injectables is available in the WHO publication *Injectable contraceptives: their role in family planning care* (22).

**Once-a-month injectables**

Once-a-month injectable contraceptives contain both estrogen and progestogen and are highly effective, with failure rates of less than 1%. Although to date monthly injectables have been used primarily in Latin America and China, two new monthly injectables, combining respectively 25 mg of DMPA with 5 mg of estradiol cypionate and 50 mg of norethisterone enantate with 5 mg of estradiol valerate, may expand the availability of this method. Some women prefer the once-a-month injectables to longer-acting injectables because they produce regular monthly bleeding and cause less spotting, and their fertility-inhibiting effects subside quickly. One major disadvantage of monthly injectables is the estrogen-related side-effects that some women experience.

As with other hormonal contraceptives, there has been concern over the safety of using some once-a-month injectables. Animal testing of some early formulations produced breast tumours in beagles and pituitary enlargement in rats. As with DMPA, it is questionable whether these results are applicable to humans. To date, multicentre clinical trials of monthly injectables have not revealed any significant adverse health effects (23, 24). As with any new method, further research and extensive post-marketing surveillance are needed to clarify the safety risks associated with its use.

**Barrier methods**

Barrier methods, which include condoms, spermicides (foam, suppositories, tablets, creams, soluble films and
jellies), diaphragms, cervical caps, and sponges, act by mechanically or chemically preventing sperm from entering the uterus. Although use-effectiveness rates are lower for barrier methods than for hormonal or surgical methods, barrier methods offer several advantages to both users and providers. The major advantage to users is the absence of long-term side-effects and complications. In addition, use of condoms, and to some extent other barrier methods, reduces the risk of STD transmission (see Chapter 4). Except for diaphragms and cervical caps, which require an initial examination and fitting by a provider, barrier methods can be obtained through non-medical suppliers.

Additional information on barrier methods is available in the WHO publication *Barrier contraceptives and spermicides: their role in family planning care* (25).

**Condoms**

Condoms are thin latex sheaths that fit over the erect penis and prevent semen from entering the vagina (natural membrane condoms, which protect against pregnancy but do not prevent HIV transmission, are also available in some parts of the world). As with other barrier methods, the effectiveness of the condom depends on the experience of the user and the consistency of use. Effective condom use depends greatly on the motivation of the user at the time of intercourse. Typical failure rates among condom users are approximately 12% in the first year of use. Highly motivated, more experienced couples who do not wish to have more children are likely to report lower failure rates than young, first-time users who want to space births. A study conducted in the United Kingdom found that older, long-term users reported failure rates of 1 per 100 couples over one year (26). By combining condom and spermicide use, higher effectiveness rates can be achieved (see box, p. 39). In general, condoms are free of side-effects, although users who are sensitive to rubber (or spermicide used as a lubricant on some condoms) may experience an adverse reaction.

Recent concern over the spread of HIV/AIDS and other STDs has resulted in considerable emphasis on condom quality assurance and user education. Several laboratory studies of condoms have found that good quality latex
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Condoms do not allow passage of HIV, although more studies on this issue are needed. One laboratory study also suggested that latex condoms lubricated with nonoxinol spermicide may provide additional protection against HIV in the event that condoms have small pinholes or break during use. Condoms do not completely protect against STDs, however: areas of the skin not covered may be infectious or vulnerable to infection. Furthermore, not all condoms are of uniform high quality. Deteriorated and poor quality condoms will provide little protection against STDs.

Spermicides

Spermicidal contraceptives consist of: (1) a sperm-killing agent; and (2) a base that distributes the agent over the cervix and physically blocks the semen from contact with the cervix. Commonly used spermicidal agents include nonoxinol, octoxinol, menfegol, and benzalkonium chloride. The spermicidal agents are delivered in the form of foams, creams, jellies, melting suppositories, foaming tablets, foaming suppositories, soluble film, lubricated condoms, and sponges. Spermicides must be used each time a couple has sexual intercourse. Effective spermicide use depends greatly on the motivation of the user at the time of intercourse. Failure rates of spermicides used alone are high during the first year of use: clinical trials have reported first-year failure rates of 28.3% for foams and 36.8% for creams and jellies, although these figures may be inflated owing to lack of user motivation. Overall failure rates have been reported as 21.8%. Spermicides can be made available without prescription from a variety of outlets. In addition to their contraceptive benefits, spermicides may reduce the likelihood of transmission of some STDs (see Table 4, p. 58).

Vaginal barrier methods

Vaginal barrier methods, such as the diaphragm, cervical cap, and contraceptive sponge, prevent pregnancy by blocking sperm from entering the uterus and by holding spermicide over the cervix. The effectiveness of vaginal barrier methods is dependent upon a variety of factors, including ability of the user to master proper use, user motivation near the time of intercourse, frequency of
intercourse, and, in the case of the diaphragm and cervical cap, provider skill in ensuring a proper fit. Theoretical failure rates of vaginal barrier methods range from 3% to 9%; typical use failure rates range from 18% to 28%. All female barrier methods can be inserted several hours before intercourse and must be left in the vagina for at least six hours after intercourse.

There are no known long-term adverse health effects from use of vaginal barrier methods, and the diaphragm and the cervical cap provide some protection against genital tract infections (see Table 4, p. 58). Short-term side-effects of these methods can include irritation caused by latex, the sponge material, or the spermicides used with the method. Most vaginal barrier methods are not widely available in developing countries.

The female condom, or vaginal pouch, is a new vaginal barrier method, currently available in the USA and several European countries. It is being promoted as a method that women can use to protect themselves from STDs and HIV infection. Its general acceptability and effectiveness, in both pregnancy and disease prevention, remain to be determined.

Natural family planning

Natural family planning (NFP) requires two actions: identification of the woman’s fertile period and abstinence from intercourse during that time. There are several methods of NFP, including the calendar or rhythm method, the cervical mucus (or Billings’) method, the basal body temperature method, and the symptothermal method. Each uses a different technique to predict periods of fertility and recommends different lengths of abstinence (Table 2). The effectiveness of all NFP methods is dependent upon the couple’s motivation to prevent pregnancy and ability to interpret the symptoms of ovulation. In general, older, more experienced users (who may also have less frequent intercourse) have lower failure rates.

The accuracy of data on effectiveness presented in the literature is questionable because of lack of standard study protocols, different amounts of training given to users, and varying definitions of user and method failure. A range of failure rates is given for each method in Table 2. The average
<table>
<thead>
<tr>
<th>Method</th>
<th>Typical use failure rates</th>
<th>Technique</th>
<th>Period of abstinence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhythm</td>
<td>Range: 16.1% to 23.7% in 4 studies&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Estimation of fertile period based on length of previous menstrual cycles</td>
<td>Mid-cycle&lt;sup&gt;c&lt;/sup&gt; (about 7 days)</td>
</tr>
<tr>
<td>Cervical mucus (Billings&lt;sup&gt;1&lt;/sup&gt;)</td>
<td>Range: 15.8% to 35.0% in 3 studies&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Monitor cervical mucus discharge</td>
<td>During menses and from onset of wet/sticky mucus until 3 days following the peak of wetness (about 14 days)</td>
</tr>
<tr>
<td>Basal body temperature</td>
<td>Range: 0.3 to 6.6 per 100 woman-years in 3 studies&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Measure rise in body temperature that follows ovulation</td>
<td>From beginning of menses until 3 days after rise in body temperature (about 17 days)</td>
</tr>
<tr>
<td>Symptothermal</td>
<td>Range: 4.9 to 34.4 per 100 woman-years (median 16) in 17 studies&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Combination of basal body temperature, cervical mucus, and other indicators of ovulation</td>
<td>From onset of wet/sticky cervical mucus to 3 days after elevated basal body temperature or 4 days after the peak of mucus, whichever is later (about 8 days)</td>
</tr>
</tbody>
</table>


<sup>c</sup> Cycle begins on first day of bleeding.
first-year failure rate for the rhythm method in a study of 15 developing countries was 19.3%; failure rates ranged from 3.7% in Mexico to 38.4% in Egypt (the Mexican rate may be distorted by errors in reporting) (12). Couples using NFP who wish to space children have been found to have higher failure rates than those who wish to avoid pregnancy: 13.36% and 2.8% respectively. Discontinuation rates are high for all NFP methods—between one-third and three-quarters of users stop within a year.

Although there are no known adverse side-effects resulting from the use of NFP, some couples may encounter difficulty maintaining periods of abstinence. Some users of NFP find that abstinence leads to better communication with their spouses as it requires the joint effort and cooperation of both people, while others find it frustrating and tension-producing. In societies that are strongly dominated by men, NFP methods may not be acceptable.

Additional information on natural family planning is available in the WHO publication *Natural family planning: a guide to provision of services* (27).

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**Multiple methods**

The use of multiple methods may be advisable to increase contraceptive effectiveness when less effective methods are used, or to increase protection against STDs. In the first case, the methods are used only for their contraceptive effect. For instance, by combining two moderately effective methods, such as the condom (12% typical failure rate) and foam (21% typical failure rate), failure rates can be substantially reduced (2.5% combined failure rate). Other combinations to increase effectiveness include condoms plus the diaphragm, and natural family planning used in conjunction with the diaphragm, condoms, spermicides, or withdrawal. Although effectiveness is greatly improved, clients may find the use of multiple methods inconvenient and thus continuation rates may be low.

When multiple methods are used to protect against STDs, a barrier method, preferably the condom, is used to prevent disease transmission and another method, such as oral contraceptives, voluntary sterilization or implants, is used to provide effective contraceptive protection.
**Traditional methods**

In some regions women still rely on traditional methods of contraception; the United Nations estimates that approximately 77 million women use traditional methods to control their fertility (28). These methods may be actual devices (for instance, vaginal sponges or wax-based cervical barriers), substances (for instance, lemon juice douches), or behavioural patterns. Little research has been done on either the efficacy or the safety of these methods.

Some behavioural patterns practised in traditional societies limit fertility. The long period of postpartum abstinence common in many cultures can have a powerful effect on fertility. The average duration of postpartum abstinence, and hence the contraceptive benefit derived from it, has been decreasing in many societies, however. Another culturally prescribed period of abstinence occurs in some cultures when a woman becomes a grandmother. At that time, the woman ceases all sexual relations and hence terminates childbearing. Other behaviours practised specifically to avoid pregnancy include coitus interruptus (see below), coitus inter crura (separated by a garment), and coitus inter femora (between the thighs).

Coitus interruptus—withdrawal—involves the withdrawal of the penis from the vagina before ejaculation takes place. It is widely used in some areas; for example, in Turkey and Poland it is used by 30% of married women of reproductive age. The main advantage of withdrawal is that, because it involves no mechanical devices or hormones, it is always available to couples. A major disadvantage of withdrawal is its relatively high failure rate: typical users experience a first-year failure rate of 18%. The average first-year failure rate for withdrawal in a study of 15 developing countries was 16.3%; failure rates ranged from 4.0% in Mexico to 34.8% in Bolivia (12) (the Mexican rate may be distorted by errors in reporting). Effectiveness is greatly dependent on user motivation at the time of intercourse. Failure is generally caused by leakage of pre-ejaculatory fluid, which can contain millions of sperm, or the man’s inability to withdraw his penis from the vagina before ejaculation. There are no adverse health effects associated with use of this method, although interruption of intercourse at the peak of sexual
stimulation may reduce the pleasure of both the woman and the man.

Providers should evaluate the safety and efficacy of a couple’s current traditional method when recommending a switch to a modern method. Some modern methods may not always be good choices for a woman currently using a traditional method. Careful, culturally appropriate counselling is always important. To facilitate a successful transition to use of modern methods, it may be advisable to recommend adoption of a modern method that is similar to the traditional method the couple is using (i.e., substituting a spermicidal tablet or suppository for a traditional sponge).

**Postcoital methods**

Postcoital methods are intended for emergency use only and are not recommended for use as a regular family planning method. They are highly appropriate in cases of unplanned, unprotected intercourse, suspected contraceptive failure caused, for example, by a broken condom, dislodged diaphragm, or missed pill, and rape or incest. To reduce the need for repeated use of postcoital methods, providers should discuss other options with their clients.

The most frequently used postcoital method involves administration of steroid hormones (estrogens or estrogen/progestogen combinations) within 72 hours of unprotected intercourse. Hormonal treatment prevents implantation, probably by causing changes in the endometrium. A commonly used dose regimen (often called the Yuzpe regimen) consists of taking 0.1 mg of ethinylestradiol and 0.5 mg of levonorgestrel as soon after exposure as possible and again 12 hours later. Regimens containing ethinylestradiol and norgestrel, danazol, levonorgestrel, or norethisterone have also been used. Most reported failure rates for the combined estrogen/progestogen treatment range from 0 to 2.0%. No serious complications or long-term effects have been reported with the Yuzpe regimen. Possible side-effects include nausea and vomiting, irregular uterine bleeding, breast tenderness, and headache. The side-effects described for use of oral contraceptives (see Table 3) also apply to use of postcoital hormones.
<table>
<thead>
<tr>
<th>Method</th>
<th>Typical first-year failure rate</th>
<th>Resupply requirement</th>
<th>Effect on breast-feeding women</th>
<th>Appropriate for women</th>
<th>Return to fertility after discontinuation of method</th>
<th>Side-effects</th>
<th>Complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vasectomy</td>
<td>0.2%</td>
<td>None</td>
<td>None</td>
<td>Yes</td>
<td>Permanent method (reversal improbable)</td>
<td>Some users experience minor swelling, pain, infection, and bruising following procedure</td>
<td>Risk of serious complications extremely low</td>
</tr>
<tr>
<td>Female sterilization</td>
<td>0.4%</td>
<td>None</td>
<td>None</td>
<td>Yes</td>
<td>Permanent method (reversal improbable)</td>
<td>Some users experience minor pain and bleeding and wound infection following procedure</td>
<td>May cause injury to other organs; increased risk of complications if general anaesthesia is used</td>
</tr>
<tr>
<td>Norplant</td>
<td>0.4%*</td>
<td>At least once every 5 years</td>
<td>Probably none</td>
<td>Yes, with some limitations'</td>
<td>Immediate</td>
<td>Users may experience infection at insertion site, irregular menstrual bleeding (longer bleeding episodes, amenorrhea, or spotting)</td>
<td>Studies to date have shown no serious long-term complications</td>
</tr>
<tr>
<td>Method</td>
<td>Effect Size</td>
<td>Frequency</td>
<td>Side Effects</td>
<td>Associated Health Concerns</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------</td>
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<td></td>
</tr>
<tr>
<td>Combined oral contraceptives (pill)</td>
<td>1-8%</td>
<td>Monthly</td>
<td>May protect against some forms of PID, May increase risk of infection with some STDs</td>
<td>No cause delayed return to fertility. Although some side-effects of OC use have been reduced with low-dose pills, some women still experience nausea, weight gain, headaches, skin colour changes, and other side-effects that may go away after several months or continue as long as oral contraceptives are taken. Increased risk of cardiovascular disease in women over 35 years old who smoke, and increased risk of hypertension; possible increased risk of cervical cancer; risk of breast cancer unclear</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Progestogen-only minipill</td>
<td>3-10%</td>
<td>Monthly</td>
<td>None</td>
<td>Yes, with some limitations’ Immediate or slight delay. Users may experience irregular menstrual bleeding (longer bleeding episodes, amenorrhoea, or spotting). Studies to date have shown no long-term complications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estrogen and progestogen injectables</td>
<td>0.2%</td>
<td>Monthly</td>
<td>Unknown</td>
<td>No Immediate or slight delay. Some users may experience nausea, weight gain, headaches, and other side-effects that may go away after several months or continue as long as injectables are used. Studies to date have shown no long-term complications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Method</td>
<td>Typical first-year failure rate</td>
<td>Resupply requirement</td>
<td>Effect on STD risk*</td>
<td>Appropriate for breast-feeding women</td>
<td>Return to fertility after discontinuation of method</td>
<td>Side-effects*</td>
<td>Complications*</td>
</tr>
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</tr>
<tr>
<td>Progestogen-only injectables</td>
<td>0.4%</td>
<td>Once every 2–3 months</td>
<td>Unknown</td>
<td>Yes, with some limitations†</td>
<td>May cause delayed return to fertility</td>
<td>Users may experience irregular menstrual bleeding (longer bleeding episodes, amenorrhea, or spotting)</td>
<td>Studies to date have shown no long-term complications</td>
</tr>
<tr>
<td>Intrauterine devices (IUDs)</td>
<td>3%</td>
<td>At least once every 3–8 years, depending on device</td>
<td>Increased risk of PID in women at risk of STDs</td>
<td>Yes; providers should follow instructions for postpartum insertion</td>
<td>Immediate after removal by trained provider (assuming no infections have occurred)</td>
<td>Users may experience pain on insertion and increased menstrual bleeding and cramping</td>
<td>Increased risk of anaemia if heavy bleeding occurs; perforation (rare); increased risk of PID, especially within four months of insertion and in women at risk of STDs. PID may lead to infertility.</td>
</tr>
<tr>
<td>Condoms</td>
<td>12%</td>
<td>Frequent</td>
<td>Protective</td>
<td>Yes</td>
<td>Immediate</td>
<td>Some users experience sensitivity to rubber or lubricants</td>
<td>None</td>
</tr>
<tr>
<td>Method</td>
<td>Use (%)</td>
<td>Frequency</td>
<td>Protection</td>
<td>Immediate</td>
<td>Side Effects</td>
<td>Consequence</td>
<td></td>
</tr>
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<td>-----------------------------</td>
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<td>-------------------------------------------------------------------------------</td>
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<td></td>
</tr>
<tr>
<td>Vaginal spermicides</td>
<td>21%</td>
<td>Frequent</td>
<td>Yes</td>
<td>Immediate</td>
<td>Some users experience sensitivity to spermicide</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Other vaginal barrier methods</td>
<td>18–28%</td>
<td>Frequent'</td>
<td>Yes</td>
<td>Immediate</td>
<td>Some users experience sensitivity to rubber and/or spermicide; some diaphragm users experience increased frequency of urinary tract infection</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Natural family planning</td>
<td>20%</td>
<td>None</td>
<td>None</td>
<td>No</td>
<td>Immediate</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Withdrawal</td>
<td>18%</td>
<td>None</td>
<td>Yes</td>
<td>Immediate</td>
<td>None</td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>

*a* Whether use of a method helps protect a user against, has no effect on, or makes users more likely to acquire sexually transmitted diseases (STDs).

*b* Side-effects are physical changes that result from use of a method but do not seriously threaten the user’s health—for instance, mid-cycle menstrual bleeding, headaches, or weight gain.

*c* Complications are conditions that result from use of a method that can be harmful to the user’s health—for instance, anaemia resulting from prolonged and/or heavy bleeding.

*d* Absolute contraindications are health characteristics or fertility intentions of a client that make use of a method inappropriate.

*e* Less effective in heavier women (over 70 kg).

*f* Steroidal methods are not the preferred choice for lactating women. If they are selected, however, use should not be initiated before six weeks postpartum.

*g* Pelvic inflammatory disease.

*h* Diaphragm, cervical cap (both used with spermicide), and contraceptive sponge.

*i* Sponges and spermicides (which are used with diaphragms and caps) require frequent resupply. Diaphragms and caps must be replaced every few years or when torn or damaged.
Insertion of a copper-containing IUD up to five days after intercourse can also be used to prevent implantation of a fertilized egg. Since 1976, over 1300 postcoital insertions have been reported with only one failure recorded. The side-effects described for general IUD use (see Table 3) also apply to postcoital use.

Women receiving postcoital contraception should return to the provider one month after administration to confirm the absence of pregnancy or receive counselling in the case of method failure. In the unlikely event that treatment fails, the possibility of ectopic pregnancy should be considered: postcoitally administered steroid hormones usually prevent uterine pregnancy but not ectopic implantation.

**Breast-feeding**

In addition to providing an ideal food for the infant and protecting the infant against disease (including diarrhoea), breast-feeding has an important contraceptive effect during the early postpartum months. A breast-feeding woman who does not feed the baby foods other than breast milk, is not yet menstruating, and is less than six months postpartum has a less than 2% probability of becoming pregnant. The chance of pregnancy increases over time, however, and with decreased frequency of breast-feeding and supplementation with foods other than breast milk. Breast-feeding does not delay the return to ovulation indefinitely, and most women who breast-feed for longer than 12 months will experience a return to menses before they stop breast-feeding. Breast-feeding women who desire continued protection from pregnancy should use an appropriate contraceptive (see box opposite).

In most cases, family planning providers should encourage women to breast-feed. Providers should give women culturally appropriate information on proper breast-feeding techniques. It is also important for providers to remind women of the importance of good nutrition and adequate rest while breast-feeding.

Additional information on breast-feeding is available in other WHO publications and documents (29, 30).
Breast-feeding and method selection

Depending upon the duration and frequency of suckling and extent of supplemental feeding, lactating women can be well protected from pregnancy. A review in 1988 (31) concluded that fully or nearly fully breast-feeding women who have not menstruated and who are less than six months postpartum are about 98% protected against pregnancy. Some women may decide to postpone initiation of another contraceptive method until after return to menses or when they reach six months postpartum. Others, particularly those who live far from family planning clinics or other sources of contraception, may decide to obtain contraceptives to complement breast-feeding immediately postpartum.

For those women who choose to initiate contraception while breast-feeding, it is important to select a method that will not interfere with the mother's ability to produce milk or adversely affect the health of the infant. Because there has not been extended research on the effects of hormonal contraception on the health of breast-feeding infants, non-hormonal methods, such as IUDs, barrier methods, and voluntary surgical contraception, should be considered for use first. If none of these is acceptable, progestogen-only minipills, Norplant, or progestogen-only injectables (DMPA and NET-EN) can be used, beginning no sooner than six weeks after delivery. Combined oral contraceptives have been shown to reduce the milk supply and are therefore not recommended for use when alternative methods are available.

Summary

A variety of contraceptive methods are available. Each method has a unique set of characteristics that may make it particularly appropriate or inappropriate for a given client. Important information on method characteristics is summarized in Table 3.

Selected further reading


4. Matching methods to clients

The match between a contraceptive method and an individual client depends upon a variety of factors. When deciding which method to adopt, clients are influenced by personal concerns, health considerations, cost, accessibility, and their cultural environment. The specific factors, as well as their relative importance, vary from couple to couple. In many cases, these factors can be influenced, either positively or negatively, by programme activities. In addition, the factors determining choice may change as clients move through their reproductive years, necessitating a re-evaluation of what method best meets an individual client's needs.

Switching methods
Finding an appropriate method is often a process of trial and error, as even the most careful screening cannot predict all the problems an individual user may encounter with a specific method. The reasons an individual or couple may choose to switch from one contraceptive method to another are varied and include:

- unacceptable side-effects
- method more inconvenient than anticipated
- desired family size obtained
- entry into non-monogamous/monogamous relationship
- desire to use male/female method
- rumours and fears about adverse health effects
- method no longer medically advised
Contraceptive method mix

- method no longer medically contraindicated
- preferred method has become accessible
- change in breast-feeding status
- method no longer available (supply exhausted).

When a switch occurs, it does not mean that the programme or method has failed. In fact, research suggests that switching among methods is related to long-term use of contraception. Therefore, facilitating method switching may lead to higher prevalence rates. When the Matlab Family Planning Health Services Project in Bangladesh modified its delivery strategy to include provision of a full range of contraceptive methods, 80% of the women were still using some method after one year (32). This was a dramatic increase over the 40% continuation rates that occurred when only condoms and oral contraceptives were available. The study attributed the increase in prevalence to the opportunity to switch methods; after 18 months women had accepted an average of 1.3 methods.

In general, it appears that increased availability of different methods, leading to increased opportunities for method switching, permits committed contraceptive users to plan their families appropriately. At the same time, because failure rates are highest during the first year of use of a new method, frequent switching could place users at increased risk of unintended pregnancy. Programmes can help decrease this risk by providing careful counselling in method use and follow-up to clients who switch methods.

Personal factors

The personal factors that enter into an individual’s decision concerning choice of contraceptive method include age, parity, age of youngest child, reproductive intentions (spacing or terminating childbearing), frequency of intercourse, relationship with partner, influence of others in decision-making process, importance of method convenience, and the user’s familiarity and level of comfort with her or his body and reproductive system.

Age

A woman’s age may affect the suitability and acceptability of certain contraceptive methods. Two groups of
users—adolescents and perimenopausal women—deserve special consideration.

In general, adolescents are not likely to have medical contraindications to method use (with the exception of nulliparous adolescents who should not use IUDs). Behavioural factors, however, can be important in determining which method will provide the best contraceptive protection. For instance, adolescents may have difficulty in complying with method use requirements such as taking a pill daily or inserting a diaphragm before having intercourse. Adolescents, married or unmarried, have also been found to be less tolerant of side-effects and therefore have high discontinuation rates. In addition, some adolescents may be at high risk of STD exposure and should choose a protective method. Young sexually active men should always be encouraged to use condoms. Proper education and counselling at the time of method selection can help individuals and couples to address the various problems (see Chapter 6). Method choice may also be influenced by factors such as sporadic patterns of intercourse and the need to conceal sexual activity or contraceptive use.

In contrast to adolescents, perimenopausal women are more likely to have medical than behavioural contraindications to use of specific methods. Hormonal methods that cause irregular bleeding patterns may not be suitable because they can mask irregular bleeding associated with an underlying gynaecological problem. In addition, irregular bleeding may make it difficult to determine the onset of the menopause and the end of any need for contraception. Conditions that are more common in older women—such as obesity, diabetes, hypertension, varicose veins, and genital tract disorders—may also prevent some of these women from using certain methods. Despite these drawbacks, perimenopausal women with no contraindications to hormonal contraceptives may find a combined estrogen-progestogen oral contraceptive to be appropriate. Benefits of oral contraceptive use in the perimenopausal period include effective contraception, control of menopausal symptoms, and reduction in incidence of gynaecological problems (including ectopic pregnancy, endometriosis, functional ovarian cysts, and endometrial and ovarian cancers). IUDs are also appropriate for monogamous perimenopausal women; copper-containing IUDs fitted after the age of 40 years can be left in place until the meno-
pause. Sterilization of the woman or her partner is a particularly appropriate method for perimenopausal women who have completed childbearing. Barrier methods are also appropriate, although couples may have difficulty using a coitus-dependent method if they have not previously used one.

**Parity**

A woman’s parity may influence whether or not a certain method is medically acceptable. In general, IUDs are not recommended for nulliparous women because of greater difficulty of insertion, higher expulsion rates than for parous women, and the possibility that IUD use may impair future fertility. For these reasons, programmes should carefully screen nulliparous women who request an IUD and inform them about other, more appropriate contraceptive options.

**Age of youngest child**

The age of a couple’s youngest child can affect method selection in two ways. In areas where infant mortality is high, some couples with young babies who do not want more children may delay acceptance of a permanent method of contraception until they are reasonably certain that the child will survive. A woman who has recently given birth may rely on the contraceptive effect of breast-feeding or choose a complementary method to use with breast-feeding (see box, p. 47).

**Reproductive intentions**

The reproductive intentions of a couple—whether they wish to space their children or limit their family size—have a clear effect on method choice. Couples who do not want more children may find methods that are highly effective, longer-acting, or permanent to be suited to their needs. Couples who want to have children in the future may be satisfied with a less effective method, knowing that a method failure would affect only the timing of their reproductive plans and not the overall number of children desired. In general, a woman will choose a method that is compatible
with the expected timing of her next birth. One study of contraceptive method choice in four developing countries found that the time before the next desired pregnancy was a major factor in determining choice; women who wished to have short-term spacing were much more likely to choose the pill or DMPA than the IUD (33). Users also need to consider whether the chosen method could limit future fertility. Voluntary sterilization will clearly limit fertility, and IUD use by women exposed to STDs could lead to impaired fertility.

*Frequency of intercourse*

The frequency with which a woman has intercourse can affect not only the risk of unplanned pregnancy but also her or her partner’s willingness to use certain contraceptive methods. Couples with a high frequency of intercourse may find highly effective methods most appropriate. They may also find it difficult to use coitus-dependent methods, such as barrier methods, consistently. In contrast, couples who have infrequent intercourse may base their contraceptive decisions on factors other than convenience of use. For example, a woman who has intercourse only a few times a month may choose barrier methods over hormonal methods because of the latter’s potential side-effects.

*Relationship with partner*

A woman’s relationship with her partner can also be a factor in her decision to select a specific method. Because in many societies couples do not communicate about family planning, it is often the woman who must obtain and use contraceptives if she wishes to control her fertility. In societies where family planning is not readily accepted, women may want to hide their use of contraceptives. Some nurse practitioners from West Africa have indicated that their clients are often more concerned with keeping their contraceptive use secret than they are with a method’s potential health effects. The use of certain methods, such as barrier methods and natural family planning, is only possible if the woman and her partner can communicate about and cooperate in the use of family planning. A stable
marital relationship is particularly important in the decision to be sterilized; broken marriage is the most common reason for requests for reversal of voluntary sterilization.

**Influence of others**

Family members, relatives, neighbours, and peers often have a substantial influence on the contraceptive method used by a couple. In a study in India and Turkey, over half of the women interviewed said their contraceptive choices were made by or with their husbands (33). The same study found that the approval of friends or relatives in selecting a contraceptive was important to 91% of women in Turkey, 68% in the Philippines, 67% in India, and 54% in the Republic of Korea.

**Method convenience**

In selecting a method, a woman should be aware of how the use of the method will affect her lifestyle. Sometimes a method will be unacceptable to a woman simply because it is not convenient in her daily routine. For example, Chinese women in some rural areas find it more convenient to use IUDs than oral contraceptives, and IUD use is almost six times more common (M. Britton, personal communication). A woman who lives a long way from a clinic may find it impossible to return regularly for a monthly injection. For convenience, she may prefer to use an IUD, which requires fewer clinic visits. Side-effects, such as irregular bleeding, may also influence method choice. In areas where women are prohibited from certain activities during menstruation, a method that causes frequent or unpredictable bleeding may not be acceptable. In contrast, a method that causes regular and lighter bleeding, such as oral contraception, may be viewed as very convenient.

Women may also be concerned about the ease of discontinuing a method. One study of contraceptive method choice found that this factor was an important reason for women who chose DMPA and oral contraceptives (33). A method such as Norplant, which requires surgical removal, may be unacceptable to women who value the freedom to discontinue method use without medical assistance.
**Familiarity with reproductive anatomy**

In order to use some contraceptive methods, women must be familiar with their reproductive anatomy and feel comfortable about touching their genitals. For example, a woman will be able to use a diaphragm or sponge correctly and consistently only if she feels comfortable about touching her vagina and understands the importance of placing the device over the cervix. Women using natural family planning methods that involve monitoring of cervical mucus must have a high degree of familiarity with their bodies and feel comfortable about touching their genitals.

Many of the personal factors discussed above change as a couple move through their reproductive years. Fig. 8 shows the methods that are most appropriate for use at different stages in the reproductive life cycle. Providers can use this diagram to help clients identify appropriate methods.

**General health factors**

The client and provider should jointly assess the client’s general health, reproductive history (including history of contraceptive use), history of STD infection and pelvic inflammatory disease, and contraindications to various methods. The prevalence of STDs in the community and the client’s possible exposure to them are also important factors for consideration.

Certain conditions—including anaemia, presence of infection or STD, cervical and uterine abnormalities, and circulatory disorders—can affect the suitability of some methods of contraception. For example, it may be desirable for an anaemic woman to adopt a contraceptive method that decreases rather than increases blood loss—for instance, DMPA. A woman who has an active genital infection should choose a method that will not cause the disease to spread either within her own body or to her partner. An IUD would not be a good choice because insertion would be likely to cause increased infection in the woman and the device would offer no protection to her partner. Condoms would be a good choice in this instance. The existence of any circulatory disorder would preclude women from considering estrogen-containing contraceptives, such as most oral contraceptives.
Contraceptive method mix

Fig. 8. Methods appropriate at different stages in a woman’s reproductive life cycle (see text for details)

**Adolescents**
- Combined oral contraceptives
- Condoms
- Vaginal spermicides
- Contraceptive sponge

**Women who wish to delay their first birth**
- Implants
- Combined oral contraceptives
- Injectables
- Condoms
- Diaphragm/cap/sponge
- Vaginal spermicides
- Natural family planning

**Breast-feeding women who wish to space births**
- Nonhormonal methods:
  - IUD
  - condoms
  - diaphragm/cap/sponge
  - vaginal spermicides
- Progestogen-only hormonal methods:
  - minipills
  - implants
  - DMPA/NET-EN

**Women not breast-feeding who wish to space births**
- Implants
- Combined oral contraceptives
- Injectables
- IUD
- Condoms
- Diaphragm/cap/sponge
- Vaginal spermicides
- Natural family planning

**Couples who wish to terminate childbearing**
- Vasectomy
- Female sterilization
- Implants
- IUD

**Perimenopausal women**
- IUD
- Condoms
- Diaphragm/cap/sponge
- Vaginal spermicides

* Less than 90% effective.
* Return to fertility may be delayed after use of injectables.
* Exclusive breast-feeding alone has a significant contraceptive effect.
* Including post-abortion clients.
or monthly injectables. Women for whom pregnancy is contraindicated should be advised to select a method that is highly effective.

**Risk of STDs**

Clients identified as being at high risk of acquiring STDs, including HIV infection, should consider the potential effects of different contraceptive methods on STD risk. Clients at risk include those with multiple sex partners, or a single partner who has multiple sex partners, and those who inject drugs or whose partners do. Currently, the condom is the most effective method—apart from abstinence—for the prevention of both HIV transmission and pregnancy and thus is the preferred contraceptive choice for those at risk of acquiring or transmitting HIV. Because condoms are not 100% effective at preventing pregnancy, clients at risk of acquiring STD should be encouraged to use another method of contraception in addition to condoms. Other barrier methods, such as the diaphragm, sponge, and spermicides, also provide some protection against STD transmission.

The contraceptive method that a person uses can influence not only the risk of acquiring or transmitting an STD but also the course of infection and long-term consequences (Table 4). In general, mechanical and chemical barrier methods that protect against lower genital tract infection also protect against upper genital tract infection. Use of oral contraceptives may increase the risk of acquiring some lower genital tract diseases while protecting against some types of upper genital tract disease, such as severe PID. Methods that protect against PID also reduce the risks of long-term consequences of PID, including tubal infertility and ectopic pregnancy.

**HIV infection and contraceptive use**

Women who are already infected with HIV have special concerns related to method selection. It is possible for an infected women to transmit HIV not only to her partner, but also to her child in utero, during delivery, and during breastfeeding. Current data suggest that roughly one-third of babies born to HIV-positive women will be infected. An
<table>
<thead>
<tr>
<th>Contraceptive method</th>
<th>Effect on STDs&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Effect on consequences of STDs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower genital tract</td>
<td>Upper genital tract</td>
</tr>
<tr>
<td>Condoms</td>
<td>Latex condoms protect against bacterial and viral STDs, including HIV&lt;sup&gt;c&lt;/sup&gt;</td>
<td>Protective</td>
</tr>
<tr>
<td>Diaphragms&lt;sup&gt;d&lt;/sup&gt;</td>
<td>Protect against STDs that infect the cervix, such as gonorrhoea, chlamydia, cervical herpes and cervical warts</td>
<td>Protective</td>
</tr>
<tr>
<td>Spermicides</td>
<td>Protect against gonorrhoea, chlamydia and a number of other STDs&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Protective</td>
</tr>
<tr>
<td>Contraceptive sponges</td>
<td>Protect against gonorrhoea, chlamydia and a number of other STDs&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Probably protective</td>
</tr>
<tr>
<td>Oral contraceptives</td>
<td>Questionable effect on gonorrhoea, may increase risk of chlamydia and external genital warts</td>
<td>May protect against PID among women with chlamydial infection, reduce severity of tubal inflammation</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Intrauterine devices</td>
<td>May increase risk of bacterial vaginosis</td>
<td>Increase risk of PID, especially within four months of insertion and with exposure to STDs</td>
</tr>
</tbody>
</table>

* Adapted from *Outlook*, 1988, 6(2), Table 1, page 4.
* Different methods provide different degrees of protection against sexually transmitted diseases (STDs): condoms, used consistently and correctly, offer the most protection.
* Natural membrane condoms may allow passage of very small STD organisms such as hepatitis B virus, human papillomavirus, and possibly HIV.
* The spermicides used with diaphragms contribute to the protective effects listed here.
* Most data relate to noroxinol and are from both in vivo and in vitro studies.
HIV-infected woman should be counselled about these additional risks of transmission to ensure that she understands the consequences of her infection on a future pregnancy and chooses a contraceptive method that is highly effective if she wishes to prevent pregnancy. WHO recommends that women who live in areas where many children die at a young age from infectious diseases (such as respiratory infections or diarrhoea) or malnutrition should be advised to breast-feed their infants irrespective of their HIV status, because the risk of transmission through breast milk is likely to be lower than the risk of the baby dying of other causes if deprived of breast milk. In settings where infectious diseases are not the primary cause of death during infancy, pregnant women known to be HIV-infected should be advised not to breast-feed but to use a safe feeding alternative.

Risk-taking behaviour

Where the incidence of STDs, including HIV/AIDS, is high, any assessment of a client's risk of exposure to these diseases should include questions about the client's sexual behaviour and his or her partner's behaviour, to determine whether or not the client or partner: currently has an STD; has multiple sex partners; has engaged in male homosexual intercourse, injecting drug use, or prostitution; or has had any blood transfusions. Counselling about STDs can be difficult because it addresses sensitive issues. Care should be taken to phrase questions in a tactful and culturally appropriate manner. If the client or partner is at high risk of transmitting or acquiring an STD, the provider should recommend use of a contraceptive that will protect against STDs as well as pregnancy.

Economic and accessibility factors

Direct costs

While programme administrators and decision-makers often consider the costs of contraception in terms of the costs of providing a method per couple-year of protection afforded by that method, individual users are more concerned with their own day-to-day budgetary constraints. One study of
Quechua Indians in Peru (34) found a significant relationship between income and contraceptive decision: couples stated that they chose to use traditional methods over modern ones, in part, because of differences in cost. Another cost factor may be whether or not the desired method requires one large payment or a series of small payments over time. At a given time, a couple may not have the available resources to finance sterilization, and may choose to use another method instead. In a survey of Brazilian couples, cost was cited as a major obstacle to sterilization (35).

Other costs

Of perhaps even greater importance than the direct economic costs of contraceptive supplies and services are the other costs associated with obtaining and using contraceptives, including the time taken to obtain contraceptives, transportation costs, and psychological costs.

A lengthy clinic visit or extended travel time to obtain contraceptives represents lost income for clients who would otherwise be working. Studies investigating the relationship between travel time and the acceptance of specific methods have shown mixed results. For example, in Thailand, travel time did not prevent users from selecting specific methods (36) (perhaps in part because programmes reimbursed clients and transportation companies for some travel costs), whereas in Colombia and Honduras method use decreased with increased travel time (37). In general, the impact of travel time on contraceptive choice appears to be related to the frequency of resupply: for methods that require frequent resupply (i.e., condoms, oral contraceptives, and monthly injectables), use decreases with increased travel time to obtain supplies; for methods that do not require frequent visits (i.e., IUDs, sterilization), travel time is less important.

The psychological costs that may have an impact on choice of contraceptive method can include feelings of embarrassment and disrespect. A woman who is embarrassed about being seen in a family planning clinic or having a pelvic examination may wish to adopt a non-clinical method that can be obtained from a more discreet source. Modesty can also affect men: registration procedures and regulations for obtaining free condoms have caused embarrassment and shame among some men. In addition to feeling embarrassed,
some family planning acceptors have complained that they are not respected by clinic staff. Inappropriate comments, particularly directed at clients of a different race or social status, can have a detrimental effect on the continued acceptance of any method.

Cultural factors

A number of cultural factors can influence an individual client’s choice of contraceptive method. These factors include locally prevalent misperceptions about various methods, religious and cultural beliefs, level of education, perception of pregnancy risk, and the status of women. Providers should be aware of how these factors affect method choice in their areas and should monitor changes likely to affect method choice.

Misperceptions about methods

Many clients make decisions about contraception on the basis of incorrect information obtained from friends and relatives or from confusing educational campaigns. Information obtained from both providers and other sources can be misleading and sensationalized, with positive method attributes being understated or overlooked and false or negative attributes being exaggerated. Common rumours include accounts of users of oral contraceptives who give birth to monsters, IUDs that float in the body and can eventually kill the user, and beliefs that use of reversible methods can make women sterile. In addition to influencing method selection, rumours can lead to incorrect use of methods and hence to method failure. Family planning providers should be aware of any rumours that are prevalent in the community and correct misperceptions about specific methods.

Religious and cultural beliefs

In some areas, religious or cultural beliefs may affect a client’s choice of method. Strictly practising Catholics, for example, are limited in their choice of contraception to natural family planning. Some Islamic leaders claim that sterilization is prohibited while others say it is permitted.
While the Islamic faith does not prohibit the use of contraceptive methods in general, women may find the irregular bleeding patterns caused by some hormonal methods to be a hardship in light of the Islamic proscription against prayer during menstruation. In some communities, Hindu women are prohibited from preparing meals during menses, so irregular bleeding patterns may again be a problem.

Level of education

Level of education affects not only willingness to use family planning, but also choice of a specific method. Several studies (38–40) have shown a greater use of the rhythm method among more educated couples. It has been hypothesized that educated women desire effective family planning but are unwilling to assume the risks associated with some modern methods of contraception.

Perception of risk of pregnancy

A couple’s perception of the risk of pregnancy affects not only the decision to use contraception but also the choice of a contraceptive method. Individuals who do not perceive themselves to be at high risk of pregnancy, as is often the case with adolescents, may use a less effective method, if any.

Status of women

Women’s status in society affects their ability to obtain and use different contraceptive methods. In areas where the status of women is rising, some women will have greater income or access to money to pay for more costly methods as well as more say in the decision-making process. Also, in areas where women are more highly regarded, there may be fewer restrictions on obtaining various methods, such as legislation requiring the husband’s consent before family planning services can be obtained.

Summary

When helping clients select an appropriate contraceptive method, providers should be aware of the factors that influence the client’s decision-making. These include personal,
health, economic, and cultural concerns. Some of these factors—such as frequency of intercourse and method convenience—affect only user preference, while others—such as breast-feeding status, health status, and risk of exposure to STDs—affect the appropriateness of use of certain methods by some clients. Occasional re-evaluations of method appropriateness may be necessary as clients move through their reproductive lives and as other factors influencing method choice change.

Selected further reading

