

# Modern methods of contraception

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## Abstract

Contraception in the modern world is an important element related to the functioning of every human being, his sexuality, reproduction and offspring planning at the most appropriate for that time. Contraception called all the procedures to obtain temporary or permanent infertility. The ideal method of contraception should be 100% effective, it cannot pose a threat to health, it should be free of side effects, it should be easily and completely reversible, easy to use and able to be used without medical supervision.

## Key words:

contraception,  
methods, Pearl index

## Admission

Contraception is a procedure to obtain a temporary or permanent infertility. Temporary infertility can be achieved using various types of contraceptives, stable and through sterilization or the sterilization. Contraceptives are the various types of preparations, chemical substances acting to prevent the occurrence or development of pregnancy. Contraception is used for temporary and numerical birth control [1,2,3].

The effectiveness of each method of contraception is assessed on the basis of the Pearl index, ie the percentage of women who became pregnant during the annual use of a contraceptive. When choosing the

appropriate method should familiarize yourself with the correct its application [4,5].

## Barrier methods

Barrier methods also known as mechanical methods are designed to prevent ingress of sperm into the cervical canal [4,5,6,7]. In addition, barrier methods protect against sexually transmitted diseases such as syphilis, gonorrhea, and infections of the ascending reproductive organ, among other things: chlamydia, herpes, HIV, and hepatitis B [3,8,9].

The effectiveness of these methods depends on the quality of the material from which they are made, the skills in the application of the method and in some cases, additional chemical formulation used. To increase the efficiency, it is recommended to use with additional chemical mechanical methods of contraception methods, or spermicides. In applying these methods, it is important to the ability to set up and use of the means of preventing pregnancy [2].

## Condoms for men

The condom is the only contraceptive used by men [10,31,38]. The male condom is a proven method of contraception that protects against HIV infection and other sexually transmitted diseases [9,10].

Most condoms are made of latex, polyurethane and silicone rubber. Persons determined to use this method of contraception should know the basic rules for its application [2,4,9,10].

Condoms are non-invasive, indifferent health, cheap and accessible, easy to use and sufficiently effective, non-working systemically. As additional advantages can replace them, as a way of postponing sexual intercourse, reducing the risk of cervical cancer and enhancing sexual experience [4,11,12].

A disadvantage of this method should be considered the fact that the improper use of a condom can cause rupture or damage during sexual intercourse. Condoms reduce the scale of the male sexual experience may cause allergic skin reactions [4].

## Female condom

Women condom, or Femidom is made of stretchy polyurethane in the form of a loose bag length of about 15 cm, diameter 7 cm. Femidom is open on one side and surrounded by a large ring that covers the vulva and facilitates the condom into the vagina, and prevents it from slipping out during intercourse. The interior of the pouch is wetted with spermicide [3,4].

The condom is only suitable for single-use [38]. However, do not use this method, as the only

anti-pregnancy. To increase effectiveness, to be combined with measures be spermicides. The Pearl Index for this method is 5-12 [4].

The advantages of this method are: execution of polyurethane rubber, which means that the risk of rupture of Femidom is ten times smaller than in the case of male condoms and it is important that Femidom not be destroyed by chemical agents, harmful to the male condom produced from latex.

It should be regarded as a disadvantage risk of abnormal vaginal introduction member to the outside of the condom, causing a lack of security. Negative characteristic of this method are also aesthetic - the rim of the condom protruding outside the vagina, is visible for both partners [9].

Diaphragm is considered unsuitable method of contraception for teenagers because of the difficulty in its premise as well as the establishment of women's condom technique can be embarrassing for a teenager [12].

## Pessary

Otherwise called a pessary or vaginal membrane is a mechanical diaphragm contraceptive for repeated use. This measure correctly entered into the vagina before intercourse cervix sufficiently isolates and its external mouth before sperm [2,4]. In this method of contraception uses chemical addition spermicidal [2,3,4,5].

The vaginal ring is composed of soft, strong metal springs, which is stretched thin rubber or rubber membrane [4]. Before the introduction of the disc to coat the vagina it on both sides of spermicide, then roll into a cylinder. For vaginal diaphragm introduced in the supine or squatting. Puck is introduced at the rear wall of the vagina until the back vault, wherein the front edge of the disc moves past the pubic symphysis [4,7]. The puck should enter into the vagina for 6 hours before intercourse. After installing, check the position of the membrane with your fingers. It is important that before each use of the diaphragm and the assumption see if there has been punctured or damaged in any other way [5,10].

When compared disc should remain in the vagina for a period of from 8 to 12 hours. Most often it is removed within 24 hours [4,5,7,10]. In order to remove the membrane must hook the index finger on the front edge and then pull out, specifically between the index finger and the other [10]. After removing the membrane should be rinsed in warm water with soap and water, dried and stored in a specially adapted box in a dry and dark place [7,10].

The effectiveness of this method based on the Pearl index ranges from 6 to 12. The effectiveness depends on the motivation of the wearer and her mastery of the art establishment and removing the disc [2,4]. Using too large pulley or leaving in the vagina for more than 24 hours can cause pain and lead to ulceration. Using this method of contraception can occur complaints from the bladder, burning in the urethra and bladder recurrent infections [4,10]. Maybe you also used an allergic reaction to spermicide or latex, which is made of the disc [10].

The advantage of the disc is a lack of systemic effects and no effect on the course of sexual activity [2]. The use of the diaphragm significantly reduces the incidence of gonorrhea, trichomoniasis and chlamydia. Another advantage is the low cost of its implementation, as the rings are durable, and kept in good condition can be used for several years [10]. Contraindications to the use of vaginal ring, the static genital disorders, allergic to rubber or spermicides and urinary tract infection [4].

## Cervical cap

The cap is small, the shape of it resembles a large thimble, perceptible during sexual intercourse. It is produced from a mass of rubber or rubber. It is assumed directly to the cervix or the vaginal vault to the front, so as to completely cover the vaginal part of the cervix, thus preventing ingress of sperm into the cervical canal [2,4,5,13].

Before each application of the cap, one should always apply spermicide [4]. After installing, it is important to check whether the cap is properly and firmly fixed on the neck of the uterus as they could easily slip. You can leave the cap on the neck longer

than previously discussed vaginal rings. This time should not be less than 6-8 hours and should not exceed 48 hours [2,4,10]. To remove the cap, squeeze it with one finger, and the second hook on the shore, and the photo should not cause major difficulties [10]. After removing the cap procedure is the same as with vaginal disc.

Too long to leave the cap on the neck can lead to release an unpleasant odor, infection or ulcer formation [10]. The disadvantage of this method is the difficulty in setting the cap and the women's mental resistance against manipulation within the genital tract [4].

The advantage of the cervical disc is its low operating cost and the possibility of leaving it for a long time on the cervix [3,4].

Contraindication to the use of this method is incorrect construction of the cervix, cervical inflammation, inflammation of the appendages and the existence of erosions vaginal portion of the cervix [4].

The effectiveness of this method of contraception is associated with the improper use of the cap. The most common reason for the failure of this method is to fall from the neck cap during intercourse [10].

## Chemical methods

Chemical methods to prevent pregnancy include spermicides in the form of pessaries, creams or foams and sponges containing them, tampons to destroy or damage the sperm [3,4,5].

Modern spermicide nonoxynol contain. The surfactant damages a cellular membrane of sperm and hinders access of sperm into the uterus by forming them impervious foam [4,11]. Nonoxynol-9 in addition to the birth control also prevents sexually transmitted diseases caused by viruses, fungi and acts anti chlamydia [3,4,5,7].

The Pearl Index of spermicides in the case is quite high and ranges from 5 to 30, and therefore it is desirable to combine chemicals with other methods, for example, the female condom or vaginal membrane [4,11,12].

Spermicide applications require 10-30 minutes before sexual intercourse. Jellies, creams and foams

retain efficacy for 8 hours, and the tablets and suppositories for less than one hour [3,4,10]. After applying the product must remain in the supine position, because getting up and walking can cause sail inside. Please note that the measure is effective only for one ratio and before the next ratio should reapply agent [2,4]. Each measure should remain in the vagina for 6 to 8 hours. During this time, do not rinse the vagina, because it will weaken action of [5].

The advantage of using spermicides is their low price and easy access. These features are popular among young people, where sexual relations are irregular or unplanned. Furthermore, these measures are easy to use [4,10]. In addition, these methods do not cause serious health risks load, they are used only when necessary, ensure proper lubrication of the vagina [4]. The disadvantage of this method is that appears during melt discharge the agent contained in gels, foams and creams, which causes unpleasant [4].

An important problem is the allergy occurring in relation to the type spermicydu. When using spermicides in women may be a problem of abnormal vaginal flora, which can lead to urinary tract infections [3,10]. The fact that these measures are beginning to work after 10 minutes of use, and some of them are not effective after 60 minutes there is a significant problem in their application. If you are allergic to the center gives the unpleasant feeling of tingling vagina and penis. Their establishment of the vagina is troublesome and embarrassing. Unpleasant outflow of spermicide from Vagina is unlikely an aesthetic application [4].

## Intrauterine contraception

Intrauterine contraceptive method inserts are releasing progestin. This is a method long-acting, having a fast reversibility and high efficacy [14,15].

The response of the uterus to insert a foreign body is to call the endometrium atrophy of endometrial glands and epithelial cells become flat. The endometrium is a distinct leukocyte infiltration of lymphocytes, macrophages and plasma cells, thus preventing implantation of the ovum [6,7]. In addition, progestogen causes changes in the cervical mucus, which

becomes impermeable to sperm [5]. The changes in the endometrium are completely reversible after removal of the insert with levonorgestrel [7]. The effectiveness of this method is kept five years, and may persist for up to seven years [14]. Pearl failure indicator according to this method is from 0.6 to 3.0 [5,6].

Levonorgestrel release liner can be assumed to seventh day of the cycle, including, without the need for additional methods of contraception, as well as at any other day of the menstrual cycle with the use of barrier methods of contraception during the first 7 days [9,14,16]. Insert assumes gynecologist, has been inspected cervical cytology, usually during menstruation because at that time the cervical canal is open, and it makes the procedure is easy to perform and painless [2,11].

Before putting the pad, make sure that the woman is not pregnant, because pregnancy is a contraindication to establish fitting [9]. After insertion may occur systolic pain, spotting, heavier menses. Indication for removal of the insert is the occurrence of inflammation of the appendages, bleeding and severe pain [6].

Among its benefits include high efficiency and a reduction in blood loss during menstruation [4,7]. The contraceptive method is very effective, fast reversibility. IUD does not require daily replenishment by a single treatment leads to the prolonged effect.

Major side effects include bleeding and spotting increase inter menstrual, especially during the first three months of treatment. Some women complain of headaches, breast tenderness, the severity of acne and other skin lesions [4]. You may receive an increased susceptibility to infections, inflammation of the vagina and cervix. At the time of the insert to be feared perforation of the uterine wall [7,16].

Contraindications to establish intra and fittings; pregnancy, past or present of gynecological inflammation, malformations of the uterus or fibroids, bleeding of unknown etiology, history of ectopic pregnancy [3,6].

The use of intrauterine devices by young girls and women who have not given birth or are contraindicated, can lead to inflammation of the appendages and later infertility [6].

## Hormonal contraception

Hormonal contraceptives are chemicals with different set of hormones, the most commonly used orally in pill form [2].

At the mechanism of action of hormonal contraceptive pill consists of estrogen and progestogen. The contraceptive effect is conditioned by the gestagen, and therefore it is possible to use only that component as contraception [5].

Gestagen component affects the endometrium, cervical mucus increases the density and reduces the permeability of sperm and affect the fallopian tubes, weakening their peristalsis, which is difficult to transport the egg. The estrogenic component, inhibits the selection and growing dominant follicle, preventing bleeding and acting progestogen. In addition, estrogens create unfavorable for the implantation of the ovum changes in the endometrium [2,5].

Among the currently available hormonal methods of contraception should be mentioned:

- combinations or estrogen-progestogen oral contraceptives;
- one-pill contains only progestin;
- progestogen implants;
- progestogen injections;
- hormonal contraceptive patches;
- hormonal vaginal rings [7].

The use of hormonal contraception should be done with doctor's orders, after having collected the interview and physical examination and cervical cytology. During the administration of hormones to prevent pregnancy, cytology should be performed every year in order to check whether there are any contraindications to continue this method of birth control [2].

Oral contraceptives reduce the amount of menstrual blood, which is a good medium for bacterial growth, thickening the cervical mucus to inhibit the passage of microorganisms from the vagina to the uterus. In addition, reduce the voltage of the uterus, thereby reducing the possibility of intrusion of microorganisms from the uterus into the fallopian tubes. So have a protective effect against pelvic inflammatory. But reckless use of sex hormones in both therapy and in contraceptive activity can permanently damage

the maturing of the hypothalamic - pituitary-ovarian and cause infertility [5].

The woman decides to take hormonal contraception should closely follow your doctor, time use the tablet, time to change your patch or vaginal ring contraceptive and hormone injection execution time [2].

## One-component oral contraceptive pill

One-way birth control pills called mini-tablet, containing in its composition progestin hormonal influence the hypothalamic axis -hypophysis - ovary and ovarian functioning and mobility of the fallopian tubes. Additionally inhibit ovulation, but occasionally ovulation may occur during use. Gestagens cause thickening of cervical mucus affect on the endometrium [4,7,16,17]. This action is dependent on the dose and type of progestogen [4]. Gestagenic mini-tablets are indicated for women who use estrogen is not recommended [17].

One component must be applied without interruption. It begins with the use of tablets in the next pack immediately after using the previous [15,17]. In addition to the use of mini pills related is the need of their regular admission, which is why this method is not recommended for young women who lead an irregular lifestyle [38]. The tablets should be taken always at the same time each day. Time value tablet adoption is 2 hours [16].

Taking contraceptive pills mono begins at any time after the previous exclusion of pregnancy. However, it is best to choose a date from the 1st to 5th day of the cycle, as this allows for proper bleeding [17]. At the start of the application mini pills woman needs to know that if she lets late in taking your tablet over two hours must accept scheduled for this day tablet immediately, and the next tablet - the usual time [16,17]. It is necessary in such circumstances, to use other additional methods of contraception for 2 days [17].

Because the composition of mini pills no synthetic estrogen, all the side effects associated with its use, including the risk of cardiovascular disease and cancer, there is the potential [17]. It is also important

that after the withdrawal of tablets showed no fertility limitations. Convenient way to use oral single-tablet is the cause of their high prevalence [7].

A disadvantage of this method of contraception must be replaced, inter alia, irregular bleeding, weight gain, headaches, depression, increase in the incidence of ectopic pregnancies, where fertilization occurs during use of the tablet and increased risk of functional ovarian cysts. A major obstacle in the application of the method is also taking pills daily regime [16,17].

## Two-component oral contraceptive pill

Two-component pill is composed of the estrogen and gestagen components [18]. This part of the tablet is an attempt to imitate the natural menstrual cycle [17].

Measure the oral contraceptive pill formulation consists of: inhibiting ovulation, preventing the maturation of follicles, reducing the penetration of the sperm cervical mucus and stimulate changes in the endometrium and the reduction of the probability of penetration by sperm [4,11,17].

Two-component contraceptives meets five important criteria for selection of the appropriate method of contraception: it is highly effective while reversibility of fertility, is a method sufficiently safe, accepted by women and has many benefits beyond contraception [18].

Use of oral hormonal contraceptive pill is best to start in the first five days of the menstrual cycle. One tablet should be taken every day, at about the same time each day for the next 21 days, then take a break lasting 7 days. During this interval is not applicable tablets and bleeding "withdrawal" [16,17]. It is important habit of taking pills for women by taking them daily without interruption. Thus, this method is gaining almost 100% efficacy [11]. In some women, the return of ovarian follicular activity may occur at the end of 7 days break in the use of hormonal oral contraception, and therefore should not be allowed to extend the period of interruption of more than 7 days [17].

If the woman forgets to take the tablets should be swallowed immediately after becoming aware of

an error or the next day should take two tablets and take more tablets according to scheme [11,15]. It is worth remembering that reduce the absorption of hormones may be due to diarrhea, vomiting and the use of certain antibiotics [16].

Rewriting the doctor for binary hormonal contraceptive pill must be preceded by a medical examination, including the medical history, blood pressure measurement, and a clinical breast examination combined with gynecological cytology smear delivery [19].

The advantages of using a binary oral contraception is its high efficiency, reducing the problems associated with menstruation [16]. In addition, two-component pill actually bring many benefits beyond contraception. These benefits include reduction in the risk of ectopic pregnancy, endometrial cancer, ovarian cancer risk reduction therapy and use as functional ovarian cysts. In addition, ensure the regularity of menstruation, reduce the abundance and painful menstrual bleeding [10,11]. When applying this method to prevent pregnancy may decrease the symptoms of acne, pelvic inflammation [17].

As the use of two-component side effects of birth control pills may arise weight gain, fluid retention, impaired glucose tolerance. Cardiovascular may appear deep vein thrombosis, pulmonary embolism, arterial thrombosis [16]. As disadvantages during oral contraceptive use include: nausea, breast tenderness, headaches, bloating and cramps [20].

Contraindications to the use of two-component oral contraceptives are pregnancy, estrogen-dependent tumors, severe liver disease, cardiovascular and thrombosis, obesity or a BMI over 35, hypertension, prolonged immobilization, vaginal bleeding of unknown etiology, and smoking [3, 10,11,17,19].

Depending on the composition of combined oral contraceptive pill stand out: single-phase tablets, or tablets with a constant composition of hormones in the cycle; biphasic tablet, or tablets having the composition of estrogen, falling on the first phase of the cycle and estrogen-progestogen tablets for the second phase of the cycle and phase tablets, or tablets of varying composition hormonal, physiological-like hormone fluctuations during the normal menstrual cycle.

## Contraceptive patches

This method involves the use of three patches stuck one week, on the same day in any place except the breast, with one week off [14,15,16]. The patch is applied on the first day of the cycle on the buttocks, upper outer arm, abdomen, or upper chest [14]. The new patch should stick each time in a different location than the previous one [15]. In place of the planned patch has skin should be clean, dry, without irritation, cleansed of creams, lotions and other cosmetic products [10].

The mechanism of action is an inhibition of the cluster ovulation, causes the in the cervical mucus changes and influences of the endometrium [21]. This method utilizes the ability of transdermal permeation of hormones into the circulation. Patches should be stored in the original container at room temperature [10].

Slices not peel off during washing or physical effort, and while in the sauna or a long swim in the sea [15]. If there is a detachment of the patch should be applied again in the same place, or if it is not possible to glue the same patch, use a new, if not gone 24 hours. Conversely, if the patch was peeled off for more than a day, immediately apply a new patch, and for the next seven days to apply additional security [14].

At the time of hormonal contraceptive patch may experience side effects such as breast pain, headaches, nausea, and a decrease in libido. May also occur in allergic reactions on the skin at the site of patch and weight gain [21]. The use of contraceptive patch also has benefits beyond contraception, which include the effect of anti-acne and reduce the severity of seboreic keratosis in the skin [21].

The advantages of the contraceptive patch include the weekly change as a more convenient form than the daily intake of birth control pills. Using this method of contraception avoiding passage through the liver, thereby hormone concentration remains constant at [18].

## Hormonal contraceptive injections

This method involves injecting intramuscularly, long-acting progestational agent. Such injections are performed every 3 months [15]. These injections are highly effective method of acting for a long time, reversible and safe [14].

Administered by injection hormone inhibits follicular development and ovulation. This hormone causes changes in the endometrium and cervical mucus, which is prevented transport of sperm and implantation of the fertilized ovum [7].

This preparation should be given by intramuscular injection in the first day of the cycle – thus do not need an additional method of contraception. If the hormone injection takes place after the first day of the cycle, you must first rule out the existence of pregnancy and tell you to use additional methods of contraception for 7 days [22]. It was confirmed that the duration of contraceptive is 14 weeks. It is, however, for 10-14 days before the expiry of that period, repeated injection [15].

The advantage of this method is its high efficiency and constant and independent of the relative protection against pregnancy [3]. Hormone injections are an ideal method for women and girls, for whom the daily intake of pills is cumbersome. This is very unobtrusive. The use of hormonal contraceptive injection brings additional benefits beyond contraception such as the alleviation of painful and heavy bleeding, premenstrual syndrome and endometriosis [14].

Irregular bleeding between periods or loss of menstrual periods, weight gain, and extended the return of fertility are the main drawbacks appearing in the application of injectable hormonal contraceptive purposes [5,14]. There may also be headache, dizziness, breast tenderness and mood swings [14].

Due to the lack of estrogenic component contraceptive injection, this method can be used in women with congenital heart disease in smokers and in those who suffer from hypertension or diabetes [4].

The indications for the contraception injection are:

- lack of reproductive plans in the coming years,
- prone to mistakes in the use of other methods,

- contraindications to the use of estrogen,
- acceptance of the obvious disorders of the menstrual cycle,
- sickle cell anemia,
- epileptic disorders [15].

#### Contraceptive subcutaneous implants

Implants are implanted subcutaneously on the inner surface of the forearm or upper arm [7]. There are in the form of sticks or rods containing hormones [5,16].

It is estimated that this method is effective for a period of 3 to 5 years [16]. By preventing the growth of luteinizing hormone inhibits ovulation implant [14].

The preparation can be made 5 days of the menstrual cycle, so you do not need to use an additional method of contraception [14]. As an advantage of this method, it is considered mainly the lack of necessity and obligation to take your pill every day or every three months hormonal injection [14]. In addition, this method provides consistent, reliable and reversible contraception. Fertility returns after one month from the date of the removal of the capsule from the subcutaneous layer.

The disadvantages of this method are irregular bleeding at the beginning of therapy and the need for surgical insertion and then removal of the implant. It may also appear in weight gain, breast tenderness, acne and the risk of ovarian cysts [4]. When using the described method may alopecia, prone to moods of depression, emotional lability, and painful menstruation [14]. In addition, as a disadvantage of this method must be replaced fairly high cost of hormonal contraceptive implants.

Hormonal contraceptive implants are a suitable method for all sexually active women in the reproductive age who wish to methods of long-acting and highly effective [10].

Contraindications to the use of the described methods are: active thrombophlebitis, undiagnosed vaginal bleeding, acute liver disease, benign or malignant liver tumors and breast cancer or suspected cancer of [10].

## Contraceptive vaginal ring

The vaginal ring is used for 3 weeks, followed by a week of rest [14,16]. Removing the ring after 21 days of bleeding provides withdrawal [15]. This method is characterized by the ease and speed of penetration of hormones by the vaginal epithelium and absence of first-pass [4].

If you leave the ring in the vagina for a period longer than 4 weeks, it is recommended to use an additional method of contraception until the expiry of seven days from the foundation of the new ring [14]. Woman alone establishes and removes the disc [10].

Defects resulting from the use of hormonal vaginal rings are mainly discomfort and difficulties in sexual activity that are associated with the presence of the disc in the vagina or the falling [4].

Contraindications to set disc are: vaginal infection and anatomical defects [10].

## Summary

Modern contraception is highly effective and allows women to choose the most appropriate for them to methods of preventing pregnancy.

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