

Short Communication

The Contraceptive Methods Table as Preventive Instrument for Avoiding Abortion

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Abstract

The review article proposes a new taxonomy for methods of contraception and birth control. In contrast to previously published tables and charts the research-based Contraceptive Methods Table (CMT) provides complete and accurate information on the various methods and classifies them according to safety and according to efficacy. Due to its encompassing information which includes convenience and mechanism of action it will be of interest not only to women in search of a personally suitable contraceptive method but also to clinicians and researchers in various fields.

Keywords: Abortion; Contraception; Effectiveness; Safety

Introduction

Recently several publications in leading medical journals, such as JAMA, have discussed the implications for abortion access subsequent to the leaked Supreme Court ruling opinion. From the viewpoint of some authors 93500 to 143500 individuals would be prevented from accessing abortion care, and 50% of all abortions are presently performed by means of medication abortion, but telehealth prescriptions for abortion medication are prohibited in nineteen states. From a medical perspective the data unearthed by legal experts call for the implementation of one of the most effective medical strategies, namely prevention. Prevention in the form of intensified contraception would not only avoid harm to individuals but would also entail economic benefits for the society by saving the costs for thousands of surgical interventions each year. A precondition for the intensification of contraception is accurate, complete, and reliable information on all the contraceptive options presently available. To fulfill this precondition a new, research-based table has been developed. It aims at answering the two fundamental questions most women ask in their attempt to find the personally most suitable method of contraception: “Does it work?” and “does its harm?” The table has been designated “Contraceptive Methods Table” in appreciation of the world-wide recognition of the “Contraceptive Failure Table” developed by the most influential authority on contraceptive efficacy and contraceptive failure, James Trussell, the recently deceased professor of economics and public affairs at Princeton University. It is he who has the merit of introducing scientific -- especially statistical -- precision into discussions on birth control and contraception. One of

his succinct statements shall serve as a preamble to the presentation of the Contraceptive Methods Table: “Most methods have a low risk of failure if they are used correctly and consistently. The most effective method for an individual woman or couple is a method that actually will be used correctly and consistently. Simultaneous use of two methods dramatically lowers the risk of failure.” [51].

Sources Cited in the Table

1. Food and Drug Administration (FDA). Medical Devices. FDA NEWS RELEASE FDA allows marketing of first direct-to-consumer app for contraceptive use to prevent pregnancy. 2018.
2. Food and Drug Administration (FDA). Birth Control (Chart). 2021.
3. Händel P, Wahlström J. Digital contraceptives based on basal body temperature measurements. *BioMed Signal Process Control*. 2019;52:141-51.
4. World Health Organization (WHO). Family planning: a global handbook for providers: evidence-based guidance developed through worldwide collaboration, 3rd ed. World Health Organization & Johns Hopkins Bloomberg School of Public Health. Center for Communication Programs. 2018.
5. Gröger S, Grüne B. Kontrazeption. In: K. Diedrich (Ed.) *Gynäkologie und Geburtshilfe*. Berlin: Springer. 2000;60-87.
6. Institute for Reproductive Health. TwoDay method. 2022.
7. Institute for Reproductive Health. Lactational Amenorrhea. 2022.
8. World Health Organization (WHO). Family planning/contraception methods. 2020.
9. Your contraception guide – NHS. 2022.
10. Centers for Disease Control and Prevention (CDC). Morbidity and Mortality Weekly Report (MMWR). Appendix D: Contraceptive Effectiveness. 2014;63(RR04):47-47.
11. Su HW, Yi YC, Wie TY, Chang TC, Cheng CM. Detection of ovulation, a review of currently available methods. *Bioeng Transl Med*. 2017;2(3):238-46.
12. Casey FE, Lucidi RS. What is the efficacy of coitus interruptus contraception? *Medscape. Ob/Gyn Women's Health*. 2020.
13. Casey FE, Lucidi RS. What advances have been made in the development of new contraceptives for women? Vaginal sponge. *Medscape. Ob/Gyn Women's Health*. 2020.
14. Mayo Clinic. Rhythm method for natural family planning. 2021.
15. Centers for Disease Control and Prevention (CDC) 2022. Reproductive Health. Contraception. *Birth Control Methods*. 2022.
16. Food and Drug Administration (FDA). Contraceptive Implants. *Medical Devices*. 2019.

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Contraceptive Methods Table: The only sure way to avoid pregnancy is not to have sex. (FDA, 2021). Percentage of women experiencing an unintended pregnancy during the first year of use of the method.

Method	Effectiveness Perfect use/ typical use	Safety (no harm) Adverse events, possible risks and complications[1]	Satisfaction (continuation of use after one year)	Mechanism of action and requirements
SAFEST (no harm) METHODS OF CONTRACEPTION				
Natural Cycles (App) “The FDA granted the marketing authorization for this app to Natural Cycles Nordic AB” (FDA 2021)	1.8%/6.5% (FDA, 2018). “The app had a “perfect use” failure rate of 1.8 percent . . .The app had a “typical use” failure rate of 6.5 percent.” (FDA, 2018) “According to reports, under typical use, the efficiency of Natural Cycles is superior to other contraceptives, including traditional fertility-awareness based methods, male condoms, and the combined pill and progestin-only pill” (Händel P, Wahlström J, 2019).	High safety. No adverse events, risks, or complications. No protection from sexually transmitted diseases.	? High convenience.	“Natural Cycles requires women to take their temperature daily using a basal body thermometer, in the morning immediately upon waking, and to enter the reading into the app, which also tracks a user’s menstrual cycle.” (FDA, 2018)
Symptothermal	<1%/2% (WHO, 2018).	High safety. No adverse events, risks, or complications. No protection from sexually transmitted diseases.	47% Satisfaction. Moderate convenience. No cost.	1. Measuring of body temperature. 2.Observation of cervical mucus (clear texture). 3. Palpation of cervix (size, position, consistency, and opening). 4. Observation of symptoms such as breast tenderness and mittelschmerz. (Gröger S, Grüne B, 2000).
Lactational Amenorrhea (LAM)	0.9%/2% (WHO 2020).	High safety. No adverse events, risks, or complications. No protection from sexually transmitted diseases.	? Low convenience. No cost.	“Lactational Amenorrhea Method (LAM) is a short-term family planning method based on the natural effect of breastfeeding on fertility. The act of breastfeeding, particularly exclusive breastfeeding, suppresses the release of hormones that are necessary for ovulation.” (Institute for Reproductive Health). Effective as long as monthly bleeding has not yet returned. Requires exclusive breastfeeding day and night of infant less than 6 months old. Fertile phase has passed when body temperature has risen (0.2-0.5° C) and remained such for 3 days. Conception is unlikely from 4th day following rise of temperature until next menstruation. (Gröger S, Grüne B, 2000).
Basal Body Temperature (BBT)	?/? (WHO, 2020). “If natural family planning is followed consistently and correctly, it can be up to 99% effective.” (Your contraception guide – NHS, 2022).	High safety. No adverse events, risks, or complications. No protection from sexually transmitted diseases.	? Moderate Convenience. No cost.	Fertile phase has passed when body temperature has risen (0.2-0.5° C) and remained such for 3 days. Conception is unlikely from 4th day following rise of temperature until next menstruation. (Gröger S, Grüne B, 2000). “. . . effects of uncertain measurements and limited thermometer resolution influence the detection result . . . uncertainty in the relation between the BBT and the true fertility.” (Händel P, Wahlström J, 2019).

Ovulation (Billings Method)	3%/24% (CDC, 2014).	High safety. No adverse events, High safety. No adverse events, risks, or complications. No protection from sexually transmitted diseases.	3% Satisfaction. Moderate convenience. No cost.	“Observing cervical mucus is the least expensive method to detect ovulation. Women may simply observe mucus found externally at the vulva or collect vaginal mucus using their fingers. While uncomplicated, this approach has still been shown to be effective.” Su HW et al., 2017). Check presence of mucus “by gently placing your middle finger into your vagina and pushing it up to around your middle knuckle.” (Your contraception guide – NHS, 2022).
TwoDay	4%/24% (CDC, 2014). 4%/14% (Institute for Reproductive Health).	High safety. No adverse events, risks, or complications. No protection from sexually transmitted diseases.	47% Satisfaction. Moderate convenience. No cost.	Fertile phase is tracked by observing presence of cervical mucus (color and consistency). Coitus is avoided during fertile days. Unprotected coitus may resume after 2 consecutive dry days or absence of secretion. “A woman using TwoDay Method checks for cervical secretions at least twice a day. If she notices secretions of any type, color, or consistency either “today” or “yesterday,” she considers herself fertile.” (Institute for Reproductive Health).
Standard Days Method (SDM)	5%/24% (CDC, 2014). 5%/12% (WHO, 2018).	High safety. No adverse events, risks, or complications. No protection from sexually transmitted diseases.	47% Satisfaction. High Convenience. No cost.	The SDM is a new formulation of the calendar rhythm method and works best if menstrual cycles are between 26 and 32 days long. Fertile period is tracked and coitus avoided (usually days 8-19 of each 26-32 day cycle).
Withdrawal (Coitus interruptus)	4%/22% (Casey FE, Lucidi RS, 2020) “Effectiveness depends largely on the man’s capability to withdraw prior to ejaculation” (Casey FE, Lucidi RS, 2020).	High safety. No protection from sexually transmitted diseases.	46% Satisfaction. High convenience. No cost.	The withdrawal method of contraception (coitus interruptus) is the practice of withdrawing the penis from the vagina and away from a woman’s external genitals prior to ejaculation to prevent sperms from entering the vagina. Timing of withdrawal is difficult. Risk of ejaculation inside vagina. Possibility of sperms entering the vagina. Pre-ejaculation fluid may contain sperms. “Pull out” may be incorrectly timed.
Calendar (rhythm)	2%/23% Fertility Awareness-based Methods: “Range of typical use failure rates: 2-23%”. (CDC, 2022).	High safety. No adverse events, risks, or complications. No protection from sexually transmitted diseases.	? High convenience. No cost.	Record the length of six to 12 of your menstrual cycles using a calendar. Determine the length of your shortest menstrual cycle: Subtract 18 from the total number of days in your shortest cycle. This number represents the first fertile day of your cycle. Determine the length of your longest menstrual cycle: Subtract 11 from the total number of days in your longest cycle. This number represents the last fertile day of your cycle. (Mayo Clinic, 2021). Caution when drugs are used (anxiolytic, antidepressant, NSAID, or certain antibiotics).
MOST EFFECTIVE METHODS OF CONTRACEPTION				

<p>Implants</p>	<p>0.05%/0.05%</p> <p>(CDC, 2014).</p> <p>“Long-acting reversible contraception (LARC), including contraceptive implants and intrauterine devices (IUDs), is highly effective, with typical-use failure rates of less than 1 pregnancy per 100 person-years of use.” (Averbach S, Hofler L, 2022).</p>	<p>Modest safety.</p> <p>“Some of the common side effects include irregular menstrual bleeding, headache, weight gain, acne, and breast pain, which may lead to discontinuation among some users. Less common risks associated with implant use include insertion and removal complications, ectopic pregnancy, and ovarian cysts. Although rare, some women who use the implant are at higher risk of developing blood clots, heart attack, or stroke.” (FDA, 2019).</p> <p>“Disruption of menstruation, complications of insertion and removal, and infection at implant site, constitute the majority of adverse effects associated with contraceptive implants.” (Singh K, Chye GC, 1998).</p> <p>Possibility of breakage and/or “migration to the pulmonary artery.” (WHO Warning, 2016).</p> <p>“Migration locations included the lung/pulmonary artery (n=9), chest wall (n=1), vasculature at locations other than the lung/pulmonary artery (n=14) and extravascular migrations (n=14) to other body sites (e.g., the axilla and clavicle/neck line/shoulder).” (Kang S et al. 2017).</p>	<p>84%</p> <p>High convenience.</p> <p>Necessity of intervention by physician.</p>	<p>Implants are small, flexible rods or capsules placed under the skin of the upper arm; they contain progestogen hormone and inhibit ovulation (release of an egg from the ovaries).</p> <p>Progestogens (progestagens or gestagens) are a class of steroid hormones which bind to and activate the progesterone receptor. Progestogens inhibit ovulation.</p> <p>“Implants must be inserted and removed by a trained clinician who uses a special insertion device to place the implant just under the skin of the patient’s upper arm. The minor surgical procedure takes a few minutes and requires a local anesthetic and a small incision. After three years of use, the implant must be removed by a trained clinician.” (FDA, 2019).</p>
<p>Male sterilization</p> <p>(Vasectomy)</p>	<p>0.10%/0.15%</p> <p>(CDC, 2014).</p> <p>“The early failure rate of vasectomy (presence of motile sperm in the ejaculate at 3–6 months post-vasectomy) is in the range of 0.3–9% and the late failure rate is in the range of 0.04–0.08%.” (Zini et al. 2016).</p>	<p>Moderate safety.</p> <p>“As a surgical operation, it has short-term and long-term complications such as hematoma formation, infection, sterilization failure, sperm granulomas, short-term postoperative pain (nodal pain, scrotal pain, and ejaculation pain), and chronic pain syndrome. Whether it increases the risk of autoimmune disease, cardiovascular disease, testicular cancer, or prostate cancer is still controversial.” (Fang Y, 2021).</p> <p>Granuloma, postvasectomy pain syndrome, vasectomy failure, regret. (NIH, 2022).</p> <p>“This syndrome has been coined by many terms including testalgia, chronic orchialgia, chronic scrotal content pain, post-vasectomy orchialgia, congestive epididymitis, and chronic testicular pain.”(Tan, 2016).</p>	<p>100% Satisfaction.</p> <p>100% Satisfaction.</p> <p>Moderate convenience.</p>	<p>Permanent contraception by cutting vas deferens. Two main methods:</p> <ol style="list-style-type: none"> 1. Incisional (one or two incisions of 1-2 cm length) 2. No-scalpel technique (encircling and securing the vas using special fixation clamps). “There is good evidence that the no-scalpel vasectomy approach decreases the risk of surgical complications, namely hematoma/bleeding and infection, compared with incisional techniques. There is good evidence that fascial interposition (FI) increases the occlusive effectiveness of ligation and excision.” (Labrecque M, 2004). <p>“A single postvasectomy semen sample at 12 weeks that shows rare, nonmotile sperm or azoospermia is acceptable to confirm sterility.” (Dassow P, Bennet JM , 2006).</p>

<p>Intrauterine contraceptives (IUD) containing levonorgestrel (Mirena)</p>	<p>0.2%/0.2% (CTFailure Table, 2011).</p>	<p>Moderate safety. Irregular bleeding, no periods (amenorrhea), abdominal/pelvic pain. (FDA 2021). “Perforation of the uterus is a recognized complication of IUD insertion. . . Perforation is a risk each time IUD insertion is carried out in the same individual; risks should be explained at every procedure, not just the first.” (Rolands et al. 2016). Risk of perforation, pelvic inflammatory disease (PID) and expulsion. (Gröger S, Grüne B, 2000).</p>	<p>80% Satisfaction. Moderate convenience.</p>	<p>T-shaped device inserted into uterus. Release of levonorgestrel. Thickens cervical mucus and prevents contact between sperm and egg. Contraindications: uterus myomatosus, uterus bicornis or subseptus, uterus hypoplasia, colpitis, endometritis, endomyometritis, salpingitis, dysmenorrhea, hypermenorrhea, undefined genital bleeding, anticoagulation therapy, and pregnancy. (GrögerS, Grüne B, 2000).</p>
<p>Progestogen-only injectables containing medroxyprogesteroneacetate (Depo-Provera) Or norethisterone enantate</p>	<p>0.2%/4% (WHO 2020) 0.2%/6% (CDC, 2014).</p>	<p>Moderate safety. Loss of bone density, irregular bleeding, bleeding between periods, headache, weight gain, nervousness, dizziness, abdominal discomfort. (FDA 2021). Irregular vaginal bleeding; delayed return to fertility after use.</p>	<p>? High convenience. Contains hormone progestine (medroxyprogesterone acetate).</p>	<p>Injections containing only progestogen (depot medroxyprogesteroneacetate or norethisterone enantate) are given once every two to three months (instead of once a month as in case of combined injectables). Contraceptive injection contains the hormone progestin (medroxyprogesterone acetate in Depoprovera). Suppresses ovulation.</p>
<p>Combined oral contraceptives (COCs) “the pill”</p>	<p>0.3%/7% (WHO 2020).</p>	<p>Moderate safety. Risk of thromboembolism. Spotting/, bleeding between periods. Nausea. Breast tenderness. Headache. Extended Regimen: “Current evidence suggests that adverse events associated with extended regimens are similar to those seen with 28-day cyclical regimens. There is also no evidence that the risk of stroke, myocardial infarction or thrombosis is increased with extended regimens compared with 28-day regimens.” (Nappi RE et al. 2016). Combined Hormonal Contraceptives (CHC): “Individuals with hypertension taking CHCs are at higher risk of acute myocardial infarction than those with hypertension who do not use CHCs. Furthermore, women taking CHCs without hypertension at baseline had a higher risk of developing hypertension compared with women who never used CHCs in 4 years of follow-up.” (Skaritanov et al. 2022).</p>	<p>67% Satisfaction. Moderate convenience.</p>	<p>“An orally active estrogen such as ethinyl estradiol is often combined with a synthetic progestin such as norethindrone. The pills are administered for 21 days, then withdrawn for 5-7 days to permit menstrual flow.” (Ganong, 1995) “Substances that mimic the action of progesterone are sometimes called progestational agents, gestagens, or progestins. They are used along with synthetic estrogens as oral contraceptive agents.” (Ganong, 1995). “Estrogen-containing methods, such as combined oral contraceptive pills, increase the risk of venous thrombosis from 2 to 10 venous thrombotic events per 10 000 women-years to 7 to 10 venous thrombotic events per 10 000 women-years.” (Teal S, Edelman A, 2021). “The untold effect of the combined oral contraceptive pill on anticancer drugs.” (Mills et al. 2022).</p>

<p>Progestogen-only pills (POPs) or “the minipill“ (Norethindrone)</p>	<p>0.3%/7% (WHO 2020).</p>	<p>Moderate safety. Spotting/, bleeding between periods. Nausea. Breast tenderness. Headache.</p>	<p>67% Satisfaction. Moderate convenience.</p>	<p>Pill has to be taken daily at the same time. Contains only progestogen, no estrogen. Thickens cervical mucus to block sperms. Prevents ovulation. The dose in a minipill is lower than the progestin dose in a combination pill.</p>
<p>Contraceptive vaginal ring (CVR)</p>	<p>0.3%/9% (CDC, 2014). <1%/7% (WHO 2018)</p>	<p>Moderate safety. Vaginal discharge. Discomfort in the vagina and irritation. Headache. Mood changes. Nausea. Breast tenderness.</p>	<p>67% Satisfaction. Moderate convenience</p>	<p>Classified as barrier method. Vaginal ring is a flexible latex-free plastic ring to be inserted into the vagina. Ring should be kept in vagina for 3 weeks and then taken out for one week. Ring can be placed into the vagina without assistance. Contains the hormones estrogen and progesterone which are released over a period of three weeks.</p>
<p>Contraceptive transdermal patch</p>	<p>0.3%/9%% (CDC, 2014). 0.3%/7% (WHO 2018). “The Pearl index (PI), or number of pregnancies per 100 woman-years, was 0.71 for overall failure and 0.59 for method failure.” (Galzote RM et al. 2017)</p>	<p>Moderate safety. Spotting/ bleeding between periods. Nausea. Breast tenderness. Headache. “The risk of developing venous thromboembolism (VTE) is about twice as high with the patch as with COCs.” (Galzote RM et al. 2017). “The case-control study using private insurance claims data found a significantly increased risk of VTE, myocardial infarction, or ischemic stroke in patch users compared to users of norgestimate-containing COC with 35 µg EE from 2002 to 2004.” (Galzote RM et al. 2017). “Side effect profile of the patch is similar to that of combined OCs, which are estrogen-related . . . nausea, breast tenderness, emotional lability, and dysmenorrhea. One unique adverse effect is application site reaction, which occurs in ~20% of users and is treatment-limiting in 2%. Adhesion of the patch remains high in humid climates and with exercise.” (Galzote RM et al. 2017).</p>	<p>49.1% Satisfaction. Moderate convenience.</p>	<p>Transdermal patch to be placed on the skin contains the hormones estrogen and progestin. The patch currently on the US market contains 150 µg norelgestromin and 35 µg ethinylestradiol (EE). The 20 cm² patch is applied once weekly for 3 weeks, followed by a patch-free week, for a 21–27 cycle. (Galzote RM et al. 2017). Prevents ovulation. Releases both estrogen and progestin. Pharmacokinetic profile comparable to combined oral contraceptives (COCs).</p>
<p>Female sterilization (tubal ligation)</p>	<p>0.5%/0.5% (CDC, 2014). <1% (WHO, 2018)</p>	<p>Moderate safety. Post-tubal ligation syndrome: Symptoms may include dyspareunia, low back pain, premenstrual tension syndrome, menstrual abnormalities (missed periods, heavy menstrual bleeding), or menopausal symptoms. Major laparoscopic complications include unplanned major surgery, transfusion, damage to surrounding structures, fever, infection, bleeding, transfusion, and readmission. (Sung S, Abramovitz A, 2022). Long-term complications: post-tubal ligation syndrome, regret and reversal.</p>	<p>100% Satisfaction. Moderate convenience (surgical intervention).</p>	<p>Surgical intervention or chemical treatment (Quinacrine is the best studied chemical agent). The technique involves blind intrauterine insertion of Quinacrine pellets through a modified intrauterine inserter. Techniques of tubal ligaton: 1. Laparoscopy, 2. Hysteroscopy 3. Laparotomy/Minilaparotomy. (Sung S, Abramovitz A, 2022).</p>

<p>Intrauterine device (IUD) containing copper (ParaGard)</p>	<p>0.6%/0.8% (CDC, 2014).</p>	<p>Moderate safety. Heavier, longer periods. Spotting between periods (FDA 2021).</p>	<p>78% Satisfaction. Moderate convenience. Amenorrhea.</p>	<p>Copper containing intrauterine device is known also as intrauterine coil. Can be used also as emergency contraception within five days of coitus. Can be left in place for up to 12 years.</p>
<p>Emergency Contraception Emergency Contraceptive Pills (ECPs) with Ulipristal Acetate (UPA), taken as a single dose of 30 mg; ECPs with Levonorgestrel (LNG) taken as a single dose of 1.5 mg, or alternatively, LNG taken in 2 doses of 0.75 mg each, 12 hours apart. Combined oral contraceptive pills (COCs), taken as a split dose, one dose of 100 µg of ethinyl estradiol plus 0.50 mg of LNG, followed by a second dose of 100 µg of ethinyl estradiol plus 0.50 mg of LNG 12 hours later. (Yuzpe method)</p>	<p><1% for ulipristal acetate 1% for progestin-only ECPs 2% for combined estrogen and progestin ECPs (WHO 2020).</p>	<p>Moderate safety. Ulipristal acetate: Headache, nausea, abdominal pain, tiredness, dizziness. (FDA, 2021). Levonorgestrel: menstrual changes, headache, nausea, dizziness, vomiting, breast pain, tiredness, lower stomach (abdominal) pain. (FDA, 2021).</p>	<p>? High convenience.</p>	<p>Copper component damages sperms. Pills to be taken twice to prevent pregnancy up to 5 days after coitus. Copper-containing intrauterine device: "Once inserted, women can continue to use the IUD as an ongoing method of contraception, or may choose to change to another contraceptive method." (WHO, 2020).</p>
<p>Copper-bearing intrauterine device for Emergency Contraception</p>	<p><1% "When inserted within 120 hours of unprotected intercourse, a copper-bearing IUD is more than 99% effective in preventing pregnancy. This is the most effective form of emergency contraception available." (WHO, 2022).</p>	<p>"It is estimated that there may be less than 2 cases of Pelvic Inflammatory Disease (PID) per 1000 users." (WHO, 2018).</p>		
<p>Male condom</p>	<p>2%/18% (CDC, 2014).</p>	<p>Moderate safety. Possibility of allergic reaction due to material (latex, polyurethane, polyisoprene, or lamb intestine).</p>	<p>43% Satisfaction. Moderate convenience.</p>	<p>Protects against sexually transmitted diseases (STD) including HIV. (FDA, 2013). "Consistent and correct use of the male latex condom reduces the risk for HIV infection and other STDs, including chlamydial infection, gonococcal infection, and trichomoniasis." (CDC, 2022).</p>
<p>Female condom (fc)</p>	<p>5%/21% (CDC, 2014).</p>	<p>Moderate safety. Possibility of allergic reaction due to material (polyurethane, natural rubber, or synthetic rubber). Difficult placement in case of vaginal prolapse or other pelvic floor dysfunctions.</p>	<p>41% Satisfaction. Moderate convenience.</p>	<p>Classified as barrier method. Female condom is a soft, loosely fitting pouch inserted into the vagina before coitus. It forms a barrier to prevent contact between sperm and egg. "The effectiveness of female condoms for preventing HIV and sexually transmitted infections (STIs) remains inconclusive." (Wiyeh AB et al. 2020)</p>

<p>Diaphragm (with spermicide)</p>	<p>6%/12% (CDC, 2014).</p>	<p>Moderate safety Irritation, allergic reaction, urinary tract infection. (FDA 2021). “Spermicide applied to the diaphragm may damage the cells lining the vagina, causing: Increased risk of contracting STIs. Vaginal irritation. Urinary tract or vaginal infection.” (Mayo Clinic. Augusta Health, 2020).</p>	<p>57% Satisfaction. Moderate convenience.</p>	<p>Classified as barrier method. Prevents sperms from entering the vagina.</p>
<p>Vaginal Sponge nulliparous women</p>	<p>9%/12% (CDC, 2014).</p>	<p>Moderate safety. “The birth control sponge may not be suitable for people with vaginal infections, a history of toxic shock syndrome(TSS), or an allergy to spermicides and polyurethane.” (Iavarone K, Satmary WA, 2022). “The ACOG states that the contraceptive sponge’s spermicide may cause vaginal burning and irritation. This irritation can increase a person’s likelihood of contracting HIV and other STIs. Some people may also have an allergic reaction to the polyurethane or sulfites present in the sponge. Rarely, individuals who use a birth control sponge can develop TSS. A person is more likely to experience TSS if they: leave the sponge in for more than 30 hours; use it while menstruating; use it shortly after giving birth; have an abortion; or experience pregnancy loss.” (Iavarone K, Satmary WA, 2022).</p>	<p>36% Satisfaction.</p>	<p>Classified as barrier method. “The vaginal sponge is made of soft disposable polyurethane foam that contains the spermicide nonoxynol-9. It offers an immediate and continuous presence of spermicide throughout a 24-hour period.” (Casey FE, Lucidi RS, 2020). A birth control sponge (a nonhormonal birth control method) is to be inserted into the vagina. “While this product can protect against pregnancy, it cannot prevent sexually transmitted infections (STIs).” (Iavarone K, 2022). The sponge causes a mechanical inhibition of sperm ascension, sperm absorption, and sperm devitalizing. “The sponge was statistically significantly less effective in both trials in preventing overall pregnancy than was the diaphragm.” (Kuyoh et al., 2002).</p>
<p>Cervical cap</p>	<p>17%/23% (FDA, 2020).</p>	<p>Moderate safety. Risk of toxic shock syndrome if kept in place for more than 48 hours. Irritation, allergic reactions, abnormal Pap test. (FDA, 2021). “Signs of toxic shock syndrome—for cervical cap or diaphragms: chills, confusion, dizziness, fever, lightheadedness, muscle aches, sunburn-like skin rash that is followed by peeling of the skin, unusual redness of the inside of the nose, mouth, throat, vagina or eyelids. (Mayo Clinic, 2022).</p>	<p>51% Satisfaction. Moderate convenience.</p>	<p>Classified as barrier method. A soft latex or silicone cup with a round rim, which fits snugly around the cervix. Spermicide has to be put inside the cap before using it.</p>
<p>Spermicides</p>	<p>18%/28% (CDC, 2014).</p>	<p>Moderate safety. Contraceptive protection only for maximal 60 minutes. (Gröger S, Grüne B, 2000).</p>	<p>42% Satisfaction. Moderate convenience.</p>	<p>Spermicides are classified as barrier method, they disturb the integrity of the sperm membrane. “Spermicides contain an active ingredient (most commonly nonoxynol-9) and a formulation used to disperse the product, such as foam or vaginal suppository.” (Grimes DA et al., 2013).</p>

<p>Sponge parous women</p>	<p>20%/24% (CDC, 2014). “Clinical trials have demonstrated an efficacy rate of 89% and 91% for parous and nulliparous women, respectively.” (Casey FE, Lucidi RS, 2020).</p>	<p>Moderate safety. “The ACOG advises that individuals who have given birth less than 6 weeks ago should not use this birth control method.” (Iavarone K, Satmary WA, 2022).</p>	<p>36% Satisfaction.</p>	<p>“For nulliparous women the sponge was as effective as a physician-prescribed barrier method (13.9 for sponge, 12.8 for diaphragm, p = 0.45); however, parous women using the sponge were twice as likely to become pregnant (28.3 for sponge, 13.4 for diaphragm, p = 0.001).” (McIntyre SL, Higgins JE, 1986).</p>
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[1] Author’s personal stratification of risk-profile based on Aggerholm Saedder E, et al. 2055: High safety (low risk): less than 1% of users experience severe adverse events (e.g. hospitalization or ICU treatment). Moderate safety (medium risk): more than 1% and less than 3% of users experience severe adverse events (e.g. hospitalization or ICU treatment). Low safety (high risk): More than 3% of users experience severe adverse events (e.g. hospitalization or ICU treatment).

17. Food and Drug Administration (FDA). Medical Devices. 2019.
18. Averbach S, Hoffer L. Long-Acting Reversible Contraception With Contraceptive Implants and Intrauterine Devices. *JAMA*. 2022;327(20):2013-4.
19. Singh K, Chye GC. Adverse effects associated with contraceptive implants: incidence, prevention and management. *Adv Contracept*. 1998;14(1):1-13.
20. World Health Organization (WHO). Department of Reproductive Health and Research. Selected practice recommendations for contraceptive use. Third edition. 2016.
21. WHO Drug Information. Etonogestrel. MHRA Drug safety update, 15 June 2016. NEXPLANON. WHO Drug Information. 2016;30:3.
22. Kang S, Niak A, Gada N, Brinker A, Jones SC. Etonogestrel implant migration to the vasculature, chest wall, and distant body sites: cases from a pharmacovigilance database. *Contraception*. 2017;96(6):439-45.
23. Labrecque M, Dufresne C, Barone MA. Vasectomy surgical techniques: a systematic review. *BMC Med*. 2014;2:21.
24. Fang Y, Junjun L, Liang D, Kun T, Xiaopeng H. Review of Vasectomy Complications and Safety Concerns. *World J Mens Health*. 2021;39(3):406-18.
25. Dassow P, Bennet JM. Vasectomy: an update. *Am Fam Physician*. 2006;74(12):2069-74.
26. Zini A, Grantmyre J, Chan P. CUA guideline: Vasectomy. *Can Urol Assoc J*. 2016 Jul-Aug; 10(7-8): E274–E278.
27. National Institutes of Health (NIH) – Vasectomy. 2022.
28. Tan PT, Levine LA. An overview of the management of post-vasectomy pain syndrome. *Asian J Androl*. 2016;18(3):332-33.
29. CTFailure Table. Source: Trussell J. Contraceptive Efficacy. In Hatcher RA, Trussell J, Nelson AL, Cates W, Kowal D, Policar M. *Contraceptive Technology*. Twentieth Revised Edition. New York, NY: Ardent Media. 2011.
30. Food and Drug Administration (FDA). Food and Drug Administration (FDA) Approved Methods of Birth Control. 2017.
31. Food and Drug Administration (FDA). 2/6/2020. Birth Control Guide. 2022.
32. Rowlands S, Oloto E, Horwell DH. Intrauterine devices and risk of uterine perforation: current perspectives. *Open Access J Contracept*. 2016;7:19-32.
33. Ganong WF. *Review of Medical Physiology*. London: Prentice-Hall International Inc. 1995 (17th edition).
34. Nappi RE, Kaunitz AM, Bitzer J. Extended regimen combined oral contraception: A review of evolving concepts and acceptance by women and clinicians. *Eur J Contracept Reprod Health Care*. 2016;21(2):106-15.
35. Skaritanov E, Wilkie G, Kovell LC. Contraception. *JAMA*. 2022;327(15):1504.
36. Teal S, Edelman A. Contraception Selection, Effectiveness, and Adverse Effects. A Review. *JAMA*. 2021;326(24):2507-18.
37. Mills G, Anderson MA, Tang C, Hamad N. The untold effect of the combined oral contraceptive pill on anticancer drugs. *The Lancet. Haematology*. 2022;9(1):e10-e11.
38. World Health Organization (WHO). 2022. Emergency Contraception. 2022.
39. Galzote RM, Rafie S, Teal R, Mody SK. Transdermal delivery of combined hormonal contraception: a review of the current literature. *International Journal of Women's Health*. 2017;9:315-21.
40. Sung S, Abramovitz A. Tubal Ligation. *StatPearls.com*. 2022.
41. Wiyeh AB, Mome RKB, Mahasha PW, Kongnyuy EJ, Wiysonge CS. Effectiveness of the female condom in preventing HIV and sexually transmitted infections: a systematic review and meta-analysis. *BMC Public Health*. 2020;20:319.
42. Mayo Clinic. Augusta Health. 2020. Diaphragm.
43. Iavarone K, Satmary WA. The birth control sponge: Is it the right choice? *Medical News Today*. 2022.
44. Kuyoh, MA, Toroitich-Ruto C, Grimes Da, Schulz KF, Gallo MG. Sponge versus diaphragm for contraception. *Cochrane Database Syst Rev*. 2002;(3):CD003172.
45. Mayo Clinic. Spermicide. 2022.
46. Grimes DA, Lopez LM, Raymond EG, Halpern V, Nanda K, Schulz KF. Spermicide used alone for contraception. *Cochrane Database Syst Rev*. 2013;(9):CD005218.
47. McIntyre SL, Higgins JE. Parity and use-effectiveness with the contraceptive sponge. *Am J Obstet Gynecol*. 1986;155(4):796-801.
48. Aggerholm Saedder E, Brock B, Nielsen LP, Krogsgaard Bonnerup D, Lisby M. Classification of drugs with different risk profiles. *Dan Med J*. 2015;62(8):A5118.
49. Medscape. Ob/Gyn & Women's Health. What is the coitus interruptus method of contraception. 2020.
50. Medscape. Ob/Gyn & Women's Health. What advances have been made in the development of new contraceptives for women? Vaginal sponge. 2020.
51. Trussell J. Contraceptive Efficacy. *Glob Libr Women's Med*. 2014.