# Contraceptives: a guide to product selection

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**Keywords:** contraceptive method choice; Medical Eligibility Criteria for Contraceptive Use; quick start of regular contraception

## Abstract

Contraception remains one of the most cost-effective public health measures to reduce rates of maternal and infant mortality. General practitioners (GPs) who provide contraceptive counselling should be able to discuss every eligible contraceptive method for the specific woman. In addition to contraceptive counselling, the GP can address other sexual and reproductive health issues, including the prevention of sexually transmitted infections at the same visit, providing a holistic approach. The World Health Organization (WHO) has online tools available to aid in contraceptive choice. The WHO Medical Eligibility Criteria for Contraceptive Use (WHO MEC) provides evidence-based recommendations to ensure that patients are medically fit to use a particular method and can safely select the most appropriate method of contraception. The Faculty of Sexual and Reproductive Healthcare (FSRH) of the Royal College of Obstetricians and Gynaecologists and the National Institute for Health and Clinical Effectiveness (NICE) also provide extensive guidelines on the use of various contraceptives. This article guides product choice available in South Africa.

Ⓟ **Peer reviewed. (Submitted: 2010-04-15, Accepted: 2010-09-05). © SAAFP**

**SA Fam Pract 2010;52(6):499-504**

## Introduction

Contraception remains one of the most cost-effective public health measures to reduce rates of maternal and infant mortality. It allows women to freely choose the number and spacing of their children. In 2008, modern contraception prevented about 188 million unintended pregnancies, 1.2 million newborn deaths, and 230 000 pregnancy-related deaths.[1]

Despite these advantages, an estimated 215 million women of reproductive age who prefer to avoid or postpone childbearing are not using an effective contraceptive method.[1] These women are either not using any method or are using traditional methods, e.g. periodic abstinence or withdrawal.[1] There may be several reasons for this unmet need. These include lack of knowledge about the risk of becoming pregnant; fear of side effects of contraceptives; influence from partners and community leaders; religious beliefs; and lack of access to family planning services.[2] A large number of unintended pregnancies occur due to lack of knowledge and myths regarding contraception, failure and discontinuation of short-term hormonal contraception.[3] Effectiveness of a contraceptive method is dependent, to varying degrees, on compliance and correct use of that method.[4] Many of these barriers can be overcome through better information and counselling for both women and men.[5] The general practitioner (GP) is in a unique position to help overcome some of these barriers. In addition, the GP can address other sexual and reproductive health issues, including the prevention of sexually transmitted infections (STI), providing a holistic approach.

## Choosing a method

GPs who provide contraceptive counselling should be able to discuss every eligible contraceptive method for the specific woman. He/she should be able to discuss the effectiveness, risks and side effects, advantages and disadvantages, and non-contraceptive benefits.[6]

The World Health Organization (WHO) has produced freely available tools to aid in contraceptive choice. The WHO Medical Eligibility Criteria for Contraceptive Use (WHO MEC) provides evidence-based recommendations to ensure that patients are medically fit to use a particular method and can safely select the most appropriate method of contraception.[7] Table I provides the four category ratings which are used when assessing eligibility.

The GP can, in addition, use a WHO-developed effectiveness chart as a counselling tool to better advise on the different tiers of contraceptive effectiveness (Table II).[8-11] This table provides the patient with a visual aid indicating contraceptive effectiveness instead of the actual failure rates per method, enabling better comparison and subsequent choice. Tier 1 contraception is the most effective, as it does not rely on compliance and correct use. Women must realise that

**Table I: WHO Medical Eligibility Criteria for Contraceptive Use (4th edition, 2009, p 9,10)[7]**

| Classification of category ratings | | |
|---|---|---|
| 1 | No restriction for the use of the contraceptive method | Use method under any circumstance |
| 2 | Advantages of using method generally outweigh theoretical or proven risks | Generally use the method |
| 3 | Theoretical or proven risks usually outweigh advantages of using method | Use not usually recommended unless other more appropriate methods are not available or not acceptable (requires expert clinical judgement and/or referral to a specialist contraceptive provider) |
| 4 | Represents an unacceptable health risk if the contraceptive method is used | Do not use the method |

**Table II: Comparing effectiveness of family planning methods (WHO 2006, Steiner, et al 2006. Adapted with permission)[8,9,11]**

| | Tier | Method |
|---|---|---|
| **More effective Less than one pregnancy per 100 women in one year** | First | Implant (Implanon®)<br>Vasectomy<br>Female sterilisation<br>IUD (Cu-IUD, LNG-IUS) |
|  | Second | Injectables<br>Lactation amenorrhoea method<br>Oral contraceptive pill<br>Patch (Evra®)<br>Vaginal ring (NuvaRing®) |
| | Third | Condoms (male and female)<br>Diaphragm<br>Sponge<br>Fertility awareness-based methods |
| **Less effective About 30 pregnancies per 100 women in one year** | Fourth | Withdrawal<br>Spermicide |

methods that rely on daily or coital administration have "typical" use failure rates (user and method failures) that are higher than the "perfect" use rates (only method failures).[12,13] In the United States, almost half of unintended pregnancies occurred in women who were using a contraceptive within the month they conceived.[14]

Women should also be aware of the common side effects (e.g. irregular bleeding) which influence the acceptability of the method and subsequent continuation rates. In women using the combined oral contraceptive (COC), 32% had stopped using it by one year.[12] Common reasons for stopping the COC are breakthrough bleeding and headache.[15] Discontinuation of a method or method switching are reasons for unintended pregnancies.[16] This can be addressed by adequate counselling prior to starting a contraceptive method, which helps to dispel some of the myths that women believe.

The best choice of agent combines WHO MEC 1 for a particular woman with the most effective/tier 1 method.

## Choosing between low and higher dose COCs

Combined oral contraceptives consist of an oestrogen and a progestogen. In order to improve safety, tolerability and acceptability, COCs have undergone considerable development over the past 40 years, including a reduction in the dose of oestrogen and the introduction of newer progestogens, which are less androgenic or antiandrogenic, giving them a more favourable clinical profile. Pills containing 35 µg or less are now considered standard and lower dose pills, containing as low as 15 µg, are being marketed without compromising efficacy. The safest pills are likely to be the lowest dose.[17]

There are several pills available in South Africa (Table III).[18] It is possible to select a product and find the exact pill to suit each individual patient at the lowest dose that will provide contraception, with the fewest side effects and added secondary benefits (Table IV).

**Table III: COCs available in South Africa (Steyn 3rd edition. 2007. p 405–425)[18]**

| | Type of oestrogen | Dose | Type of progestogen | Dose |
|---|---|---|---|---|
| Minesse® | EE | 15 µg | GSD | 60 µg |
| Mirelle® | EE | 15 µg | GSD | 60 µg |
| Melodene® | EE | 20 µg | GSD | 75 µg |
| Mercilon® | EE | 20 µg | DSG | 150 µg |
| Yaz® | EE | 20 µg | Drospirenone | 3.0 mg |
| Nordette® | EE | 30 µg | LNG | 150 µg |
| Femodene® | EE | 30 µg | GSD | 75 µg |
| Minulette® | EE | 30 µg | GSD | 75 µg |
| Marvelon® | EE | 30 µg | DSG | 150 µg |
| Yasmin® | EE | 30 µg | Drospirenone | 3.0 mg |
| Triphasil® | EE | 30/40/30 µg | LNG | 50/75/125 µg |
| Logynon® | EE | 30/40/30 µg | LNG | 50/75/125 µg |
| Tri-Minulet® | EE | 30/40/30 µg | GSD | 50/70/100 µg |
| Triodene ED® | EE | 30/40/30 µg | GSD | 50/70/100 µg |
| Brevinor® | EE | 35 µg | NET | 0.5 mg |
| Dianne35®<br>Ginette®<br>Minerva® | EE | 35 µg | Cyproterone acetate | 2 mg |
| Tricilest®<br>Cilest® | EE | 35 µg | NGS | 180/215/250 µg |
| Trinovum® | EE | 35 µg | NET | 0.5/0.75/1 mg |
| Biphasil® | EE | 50 µg | LNG | 50/125 µg |
| Ovral® | EE | 50 µg | NGS | 500 µg |

EE: ethinyloestradiol; GSD: gestodene; DSG: desogestrel; LNG: levonorgestrel; NET: norethisterone; NGS: norgestimate

The majority of women can use COC safely if the WHO MEC are applied.[7] Table V provides a summary of the conditions for Category 4, where COCs provide an unacceptable

**Table IV: Non-contraceptive benefits of oral contraception[18,19]**

| |
|---|
| • Reduction in menstrual disorders such as irregular cycles, menorrhagia (and resultant iron deficiency anaemia), dysmenorrhoea and premenstrual syndrome |
| • Reduction in occurrence of functional ovarian cysts and carcinoma |
| • Reduction in occurrence of endometrial carcinoma |
| • Reduction in occurrence of ectopic pregnancy |
| • Some protection against pelvic inflammatory disease |
| • Reduction in benign breast disease |
| • Probable reduction in risk of rheumatoid arthritis |

**Table V: UKMEC Category 4: unacceptable health risk and should not be used[6,17]**

| |
|---|
| **Breastfeeding:** < 6 weeks postpartum |
| **Smoking:** aged ≥ 35 years and smoking ≥ 15 cigarettes per day |
| **Obesity:** BMI ≥ 40 kg/m$^2$ |
| **Cardiovascular disease:** multiple risk factors for arterial cardiovascular disease |
| **Hypertension:** blood pressure ≥ 160 mmHg systolic and/or ≥ 95 mmHg diastolic; or vascular disease |
| **Venous thromboembolism**: currently (on anticoagulants) or past history |
| **Major surgery with prolonged immobilisation** |
| **Known thrombogenic mutations** |
| **Current or history of ischaemic heart disease** |
| **Stroke** |
| **Valvular and congenital heart disease:** complicated by pulmonary hypertension, atrial fibrillation, history of subacute bacterial endocarditis |
| **Migraine headaches:** with aura at any age |
| **Gestational trophoblastic neoplasia:** when hCG is abnormal |
| **Breast disease:** current breast cancer |
| **Diabetes:** with nephropathy, retinopathy, neuropathy or other vascular disease, or diabetes of > 20 years' duration (category given will depend on disease severity) |
| **Viral hepatitis:** active disease |
| **Cirrhosis:** severe decompensated disease |
| **Liver tumours:** benign and malignant |
| **Raynaud's disease:** secondary with lupus anticoagulant and thus a tendency to thrombosis |

health risk and should not be used.[6,17] The Faculty of Sexual and Reproductive Health (FSRH) of the Royal College of Obstetricians and Gynaecology has developed a guideline on the first prescription of oral contraception to assist health care professionals.[17]

## Transdermal combined contraceptive system (Evra®)

This system is a 20 cm$^2$ patch that releases 150 µg norgestromin (active metabolite of norgestimate) and 20 µg ethinyl oestradiol daily.[20] A new patch is applied weekly for three weeks, followed by a patch-free week during which a withdrawal bleed occurs. The current recommendation for women who wish to delay the withdrawal bleed is that they can continue applying the weekly patch until six consecutive patches have been applied.[20]

Efficacy is similar to the COCs and contraindications for use are the same as that of COCs.[19] Side effects are similar to the COCs, except for increased breast tenderness, nausea and breakthrough bleeding in the first two cycles. Local skin reactions which lead to discontinuation occur in 2.6% of women.[21] Contraceptive failures have occurred in women weighing > 90 kg and use is not recommended in these women.[19,20]

## Progestogen-only injectable contraception (POIC)

In South Africa, about 27% of women use a POIC.[22] Depot medroxyprogesterone acetate 150 mg (DMPA, Petogen®) is given intramuscularly every 12 weeks and norethisterone enantate 200 mg (Nur-Isterate®) is given every eight weeks. Their principal mode of action is prevention of ovulation, but POICs also thicken the cervical mucus, preventing sperm penetration and rendering the endometrium unfavourable for implantation.[23]

Even though DMPA has a theoretical failure rate of 0.3% over one year, it still requires the user to attend a clinic four times a year.[24] Continuation rates are poor, mainly due to changes in bleeding patterns, which result in adjusted one-year failure rates of 3–5%.[12,23,25] As a consequence, POIC is only a second-tier effective contraception (see Table II).[24]

Most women experience changes in their bleeding pattern, such as infrequent or prolonged bleeding and spotting. However, up to 70% of women will be amenorrhoeic after one year. There is an association with DMPA and weight gain.[23] The mean weight gain is 3 kg over two years.[26]

One of the main concerns with DMPA use is its effect on bone mineral density which appears to recover after discontinuation.[23] This is a concern particularly in women younger than 18 years in whom usage of DMPA is WHO MEC Category 2.[7] However, the FSRH advises that DMPA can be primarily used in adolescents after all other methods have been considered. All women should be re-evaluated on the risks and benefits of use of DMPA every two years and it can be used up to 51 years of age.[23]

## Subdermal implants

Various subdermal implants are available, which contain either levonorgestrel (LNG) or etonogestrel (ETG). Implanon® is the only subdermal implant registered in South Africa and is due to be launched in 2010 (personal communication, Meshack Radebe). It is a single, match-sized rod containing 68 mg ETG that is inserted subdermally on the inner, upper arm and is licensed for three years' use.[27] Implanon® is the most effective contraception available, with equal typical and perfect use failure rates. It is more effective than female or male sterilisation.[7,12]

The primary mode of action is by preventing ovulation, but it also has an effect on cervical mucus and on the endometrium. However, oestrogen levels are normal and there is no effect on bone density. There is no evidence that it delays return to fertility on removal. In addition, there is no evidence that there is an effect on mood, weight or libido.[4,27]

Implanon® does have an effect on bleeding patterns, with 20% of women experiencing amenorrhoea and 50 % of women having unpredictable or prolonged bleeding.[4,27] Up to 43% of women will discontinue Implanon® prior to completion of the three years, most of whom do so because of irregular bleeding patterns.[4] Discontinuation rates of Implanon® are similar to those of COCs at 36 months.[28]

## Intrauterine device (IUD)

The newer generation IUDs contain either levonorgestrel (LNG) or copper and are extremely safe, highly effective, and long lasting but reversible.[29,30] IUDs are first tier effective methods (see Table II). Women and health professionals still have widespread misconceptions about IUDs. These are that IUDs cause ectopic pregnancy, infertility, pelvic infection, should not be used in teenagers and nulliparae, and should not be used in women with HIV.[31]

The risk of infection increases during the 20 days after insertion due to contamination, with pre-existing organisms, of the endometrial cavity and, thereafter, returns to that of non-IUD users.[32] The FSRH recommend that women who are at higher risk of STIs, determined by sexual history, should be screened and treated.[30] Prophylactic antibiotics do not reduce upper genital tract infection or improvement in continuation rates.[33] The risk of uterine perforation for the IUDs is less than two in 1 000 and expulsion occurs in 5% of women usually within the first three months after insertion.[30]

According to the WHO MEC, IUDs can be used in teenagers, nulliparae and women with HIV and AIDS who are clinically well on antiretrovirals. IUD placement post first and second trimester abortion is WHO MEC Category 1 and 2 respectively.[7]

### Copper-containing IUD ( Cu-IUD)

The effectiveness of Cu-IUDs increases with increasing surface area of the copper. The CuT380A® and CuT380S® are more effective than the other Cu-IUDs, with less than 2% pregnancies at five years.[29,30] The CuT380A® (registered in South Africa for ten years' use) and Dalcept Cu375® (registered for five years' use) are available in South Africa.

The principal mechanism of action is due to the copper effects on sperm motility, preventing fertilisation.[30] In addition, the Cu-IUD prevents implantation due to its inflammatory reaction on the endometrium. The main side effects are pain, spotting, light bleeding and menorrhagia which occur in the first 3-6 months and usually ameliorate with time. [30]

### Levonorgesteral intrauterine system (LNG-IUS)

The LNG-IUS (Mirena®) is a T-shaped IUD with a reservoir containing 52 mg levonorgestrel, releasing 20 µg per 24 hours, and is effective for five years. The failure rate is less than 1% at five years.[30] Its main contraceptive effects are inhibition of implantation and reduced sperm penetration of the cervical mucus.[30,31]

Irregular bleeding and spotting are common within the first six months but, by one year, 65% of women experience light bleeding or amenorrhoea. The LNG-IUS has many non-contraceptive benefits, which include the treatment of heavy menstrual bleeding, dysmenorrhoea and pain associated with endometriosis.[30,34,35] It can also be used in women with endometrial hyperplasia and as endometrial protection for those on oestrogen therapy.[36]

## Contraception when taking concurrent drugs including teratogenic drugs

One must always consider drug interactions and potential teratogenicity when prescribing any medication to women who are of reproductive age. Contraceptive hormones may increase or decrease the serum concentration of concurrent drugs used, which is relevant when there is a narrow therapeutic range. In addition, serum concentrations of contraceptive hormones may be increased or decreased by concurrent drugs influencing their contraceptive effectiveness.[37]

Liver enzyme-inducing drugs reduce the contraceptive efficacy of COCs, progestogen only pills (POPs) and implants by increasing their metabolism. This does not appear to apply to progestogen-only injectables, depot medroxyprogesterone acetate (DMPA) and the LNG-IUS. Drugs may also influence the colonic bacteria which enable enterohepatic circulation of ethinyl oetradiol. There is no enterohepatic circulation of progestogens and their efficacy is not influenced by drugs affecting colonic bacteria.[37]

Non-prescription drug or herbal drug history should be elicited, as these may also induce liver enzymes. A good example of this is the commonly used St John's Wort. This is especially important when using potential teratogens. Women exposed to teratogens or long-term liver-inducing agents should be advised to choose a contraceptive method of which efficacy is not influenced by these drugs, and which does not rely on daily user compliance. Good examples of these are DMPA, LNG-IUS and non-hormonal Cu-IUDs.[37] The WHO MEC is, once again, a good tool to use when prescribing contraception to women using various drugs.[7]

## HIV/AIDS and contraception

The GP should always promote the importance of the use of male or female condoms and recommend their use whenever there is any possibility of exposure to STIs, including HIV. This should be encouraged and facilitated where appropriate. Male latex condoms have

been proven to be highly effective against STI/HIV when used consistently and correctly.

## Antiretroviral therapy and hormonal contraception

Antiretroviral drugs have the potential to alter the bioavailability of hormonal contraceptives.[7] There are limited data that imply potential drug interactions between many antiretroviral drugs and hormonal contraceptives. This is the case in some non-nucleoside reverse transcriptase inhibitors and ritonavir-boosted protease inhibitors. These interactions may alter the safety and effectiveness of both the hormonal contraceptive and the antiretroviral drug. According to the latest WHO MEC, for a woman on antiretroviral treatment who decides to initiate or continue hormonal contraceptive use, consistent use of condoms is recommended.[7] This prevents HIV transmission and compensates for any possible reduction in the effectiveness of the hormonal contraceptive. A COC preparation containing a minimum of 30 µg EE should be used.[38]

## Antiretroviral therapy and IUDs

There is no known interaction between antiretroviral therapy and IUD use. According to the WHO MEC, AIDS is classified as Category 3 for insertion and Category 2 for continuation, unless the woman is clinically well on antiretroviral therapy, in which case both insertion and continuation are classified as Category 2.[7]

## Emergency contraception (EC)

Emergency contraception can be used as a backup contraceptive to help prevent unintended and unplanned pregnancies after unprotected sexual intercourse.[39] These methods include the use of emergency contraceptive pills (ECPs) or Cu-IUDs. ECPs should not be used as regular contraception.

Mifepristone and ulipristal acetate are very effective, but not available in South Africa as EC. Levonorgestrel is very effective, with few adverse effects, and is preferred to combined oestrogen and progestogen administration. A single dose of a dedicated progestogen-only ECP, containing 1.5 mg levonorgestrel, can be used within 120 hours after unprotected sexual intercourse.[39] This is specifically formulated and packaged as Escapelle®. A two-pill dose, each dose containing 0.75 mg levonorgestrel (Norlevo®) which must be taken no more than 12 hours apart or together as a single dose, is also available.[15] A Cu-IUD is the most effective form of EC and can be retained for ongoing contraception. Despite the proven efficacy of ECP, the increased use of ECPs has not been shown to reduce unintended pregnancy rates at a population level. Further research is needed to explain this finding and to define the best ways to use EC to produce a public health benefit.[40] Efforts should be targeted at vulnerable groups, such as adolescents and women presenting for urgent care. At the time of the visit, regular contraception should be promoted and initiated (see Table VI).[41]

**Table VI: Rapid initiation of regular contraception at time of EC request[41]**

| |
|---|
| 1. If client is eligible for EC, offer Cu-IUD, which can be used for regular contraception. |
| 2. If client prefers ECPs, discuss regular contraception and offer to start combined oral contraception, patch or injectables at time of visit. |
| 3. If the first day of the last menstrual period was more than five days ago, do a urine pregnancy test. |
| 4. Advise client that a negative pregnancy test is not conclusive, but hormones will not harm the foetus. |
| 5. Take ECPs today and start with regular method the following day. |
| 6. Do a follow-up urine pregnancy test in two weeks. |
| 7. If negative, continue with method. |
| 8. If positive, provide appropriate counselling. |

## Conclusion

Choosing a contraceptive method can be quite a daunting task for both the patient and the GP, who often resorts to the most familiar method and not necessarily the most effective. The WHO MEC can help guide the GP in counselling women on various methods for which they are medically eligible, ensuring safety. The advantages, including non-contraceptive benefits, disadvantages, side effects, and effectiveness of each eligible method should be discussed, enabling the woman to choose a method most acceptable to her.

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