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Sexual Health: Contraception

Gillian Graves, MD, FRCSC

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Goals of Therapy

- Prevent pregnancy
- Individualize contraceptive method based on specific needs, lifestyle, age, parity and desire for future fertility

Investigations

Prior to initiating contraceptive methods, certain baseline measures are required.

- Pregnancy test
- Weight
- Blood pressure in women considering combined estrogen-and progestin-containing contraceptives (COCs)
- Bimanual examination and cervical inspection for women considering intrauterine devices (copper-IUD or LNG-IUS), cervical cap or diaphragm
- STI screening for women considering intrauterine devices

Therapeutic Choices

Assess the woman's contraceptive needs. Effective contraception and education reduce rates of maternal and child mortality, as well as population growth. Individual contraceptive needs change over time. Preferred contraceptive methods for young women are reversible, affordable and have good safety profiles and low failure rates. The method chosen should not interfere with other physiologic processes, e.g., vaginal lubrication, spontaneity or pleasure of either partner. Present contraceptive choices along with appropriate counselling to each individual. Many newer options are available such as route of delivery, dosage, regimens and generic products.

Nonpharmacologic Choices

Nonhormonal contraceptive options such as natural timing, barrier methods, spermicides, IUDs and surgical sterilization are included in [Table 3](#).

Pharmacologic Choices

Hormonal contraceptive options are presented in [Table 4](#).

Combined Estrogen- and Progestin-containing Contraceptives

Combined Oral Contraceptives (COCs)

COCs combined with male condoms (for STI protection) are the method of choice for most young couples, including teens. COCs containing synthetic estrogen and progestogen (progestin) have been modified as a result of synthesis of more potent steroids. This has led to dose reduction, increased safety and reliability and decreased adverse effects. Absolute contraindications of COCs are listed in [Table 1](#).

Significant differences have not been shown between monophasic and triphasic COCs in regard to bleeding pattern or efficacy.¹⁴ Fixed-dose (monophasic) COCs are easier to manipulate than triphasic COCs. Low-dose COCs with 20–25 µg EE are effective contraceptive agents with pregnancy rates between 0.07 and 2.1 pregnancies per 100 woman-years of treatment.¹⁵ They demonstrate reduced symptoms of bloating and breast tenderness¹⁶ and may be used in individuals who experience adverse effects with higher EE doses. However, low dose COCs may be associated with more bleeding pattern abnormalities.¹⁷

Most COCs are available in 28-day cycles (21 days of active medication with a 7-day hormone-free interval); for other regimens, see [Extended or Continuous Use of Combined Hormonal Contraceptives \(CHC\)](#).

Table 1: Absolute Contraindications to Combined Oral Hormonal Contraception¹², ¹³

- Breast cancer or hormone-dependent cancer
- Cerebrovascular disease, history of cerebrovascular accident
- Complicated valvular heart disease
- Current or past history of venous thromboembolism or pulmonary embolism, known thrombogenic mutations (e.g., factor V Leiden), prothrombin mutation, protein S, protein C and antithrombin deficiencies or other known coagulation-factor deficiency
- Diabetes with microvascular complications
- History of or current MI or ischemic heart disease, vascular disease
- <6 weeks postpartum if breastfeeding
- Migraines with aura at any age
- Hypertension (SBP ≥160 mm Hg or DBP ≥100 mm Hg)
- Severe cirrhosis or liver tumour
- Smoker >35 years of age (≥15 cigarettes/day)

The progestin component of COCs may vary among different agents; see [Table 2](#) for a list of COCs divided by progestin type. Products containing *third-generation progestins* (e.g., desogestrel, norgestimate) are less androgenic and may be useful in acne. While not approved by Health Canada for contraception, **cyproterone acetate** is a progestin with antiandrogenic activity that is used in combination with ethinyl estradiol (EE) for the treatment of moderate-severe acne. Most oral contraceptives, however, improve mild to moderate acne (see [Skin Disorders: Acne](#)).

Drospirenone is related to the aldosterone antagonist spironolactone and has both progestational and antiandrogenic activity.¹⁸ A Cochrane review of 5 trials shows drospirenone-containing COCs may benefit women with premenstrual dysphoric disorder (PMDD), but there is limited evidence of benefit for milder disease or for greater than 3 cycles of use.¹⁹ Several observational studies concluded that drospirenone-containing COCs may confer a higher risk of venous thromboembolism than COCs containing other progestins (see [Risks Associated with Hormonal Contraception](#)).²⁰, ²¹, ²²

[Table 2](#) lists the relative hormonal activity of various oral contraceptive products.

Contraceptive Vaginal Ring

An estrogen/progestin-releasing vaginal ring (NuvaRing) provides a more uniform contraceptive hormone concentration throughout the day,²³ thus avoiding daily hormonal fluctuations. Since both hepatic first-pass and gastrointestinal metabolism are avoided, lower doses of hormones can be used. Cycle control is good, with irregular bleeding in 5.5% of cycles and withdrawal bleeding in 98.5% of cycles.²⁴, ²⁵ One case of mesenteric vein thrombosis has been reported.²⁶ The ring can be used without interfering with intercourse. Failure rate is 0.65 per 100 woman-years.¹⁵ A randomized controlled trial of 3 vaginal ring regimens (49, 91 or 364 days) compared to the usual 28-day cycle of ring use showed the frequency of breast tenderness, weight changes, headache and mood change were similar in all groups. Breast soreness was more frequent with continuous use than cyclic use. Compared with 28-day regimens of ring use, a 49-day extended use showed a mean decrease of 2% in bleeding/spotting days. Using it for 91 or 364 days increased the mean days of bleeding by 3.5 and 7.1 % respectively; more women discontinued therapy with the longer extended regimens.²⁷

Table 2: Hormonal Activity of Combined Oral Contraceptives

| Oral Contraceptive Products | Components | Relative Hormonal Activity | | |
|---|---|----------------------------|-----------|----------|
| | | Estrogen | Progestin | Androgen |
| Products with first-generation progestins | | | | |
| Minestrin 1/20 | ethinyl estradiol 20 µg/norethindrone 1 mg | + | +++ | +++ |
| Loestrin 1.5/30 | ethinyl estradiol 30 µg/norethindrone 1.5 mg | + | +++ | ++++ |
| Demulen 30 | ethinyl estradiol 30 µg/ethynodiol diacetate 2 mg | + | ++++ | +++ |
| Brevicon 0.5/35, Ortho 0.5/35 | ethinyl estradiol 35 µg/norethindrone 0.5 mg | +++ | + | + |
| Synphasic (biphasic) | ethinyl estradiol 35 µg/norethindrone 0.5/1 mg | +++ | ++ | ++ |
| Brevicon 1/35, Ortho 1/35, Select 1/35 | ethinyl estradiol 35 µg/norethindrone 1 mg | +++ | +++ | +++ |
| Ortho 7/7/7 (triphasic) | ethinyl estradiol 35 µg/norethindrone 0.5/0.75/1 mg | ++++ | ++ | ++ |
| Products with second-generation progestins | | | | |

| Oral Contraceptive Products | Components | Relative Hormonal Activity | | |
|--|--|----------------------------|-----------------|----------|
| | | Estrogen | Progestin | Androgen |
| Alesse, Alysenna | ethinyl estradiol 20 µg/levonorgestrel 0.1 mg | + | + | ++ |
| Triquilar (triphasic) | ethinyl estradiol 30/40/30 µg/levonorgestrel 0.05/0.075/0.125 mg | ++ | + | ++ |
| Min-Ovral, Portia, Seasonale, Seasonique | ethinyl estradiol 30 µg/levonorgestrel 0.15 mg | ++ | ++ | +++ |
| Products with third-generation progestins | | | | |
| Apri, Marvelon, Ortho-Cept | ethinyl estradiol 30 µg/desogestrel 0.15 mg | ++ | +++ | + |
| Cyclen | ethinyl estradiol 35 µg/norgestimate 0.25 mg | +++ | + | + |
| Linessa | ethinyl estradiol 25 µg/desogestrel 0.1/0.125/0.15 mg | ++ | +++ | + |
| Tri-Cyclen Lo (triphasic) | ethinyl estradiol 25 µg/norgestimate 0.18/0.215/0.25 mg | +++ | + | + |
| Tri-Cyclen (triphasic) | ethinyl estradiol 35 µg/norgestimate 0.18/0.215/0.25 mg | +++ | + | + |
| Products containing drospirenone (antiandrogenic) | | | | |
| Yasmin, Zarah | ethinyl estradiol 30 µg/drospirenone 3 mg | ++ | ++ ^a | — |
| Yaz, Yaz Plus | ethinyl estradiol 20 µg/drospirenone 3 mg | + | ++ ^a | — |

^a. Best estimate; data lacking.

Adapted with permission from Regier L, Downey S. Contraceptive, combination hormonal products—Prescription. In: *RxFiles. Drug comparison charts*. 8th ed., 3rd printing, Jan. 2014. Available from: www.rxfiles.ca. Subscription required.

Transdermal Contraceptives

A transdermal estrogen/progestin patch (Evra) has similar contraceptive efficacy, cycle control and ovulation suppression to COCs,^{28, 29} and better compliance (88% vs 78% for COCs).^{30, 31} The pregnancy rate is between 0.70 and 0.88 pregnancies per 100 woman-years of treatment.^{15, 32} For women weighing 90 kg or more, this method may not be effective. Obesity may also affect follicular development through various mechanisms in patients taking oral contraceptives.^{33, 34}

Extended or Continuous Use of Combined Hormonal Contraceptives (CHC)

Use of extended cycles (with planned hormone-free intervals) or continuous use of pills, rings or patches without a hormone-free interval may provide patients with relief from severe dysmenorrhea, heavy flow or socially undesirable flow.³⁵ This can be achieved with products marketed for extended use (84 active tablets and 7 placebo tablets) or by the use of any pill, patch or ring in a continuous regimen (users take no break in between packages). Hormone-free intervals between cycles of any length should not exceed 7 days.

Compared to a 28-day cycle, extended cycles or continuous use of CHCs results in fewer bleeding days, decreased likelihood of side effects (e.g., pelvic pain, headache, bloating, swelling and tenderness) and helps improve symptoms of endometriosis and polycystic ovary syndrome.³⁵ One of the side effects or disadvantages of extended/continuous use is irregular unscheduled bleeding. If an inadvertent pregnancy occurs (due to several missed pills or forgotten change of patch or ring) a woman may not realize she is pregnant without the amenorrhea that might otherwise alert a cyclic contraception user that she could be pregnant.

Progestin-only Contraceptives

Oral Progestin

Norethindrone (Micronor) inhibits cervical sperm penetration by thickening the cervical mucus. Regular and consistent use is necessary to maintain contraceptive efficacy since effect on cervical mucus decreases rapidly 22 hours after dosing. A backup method for the first month of use is recommended by the manufacturer, although some experts agree that 2 days of backup may be

sufficient.³⁶ If a dose is missed by more than 3 hours, a backup method is required. Norethindrone can be used in women >35 years of age who smoke, who cannot tolerate estrogen, have unwanted side effects with COCs, experience migraine headaches with neurologic symptoms or in women who are breastfeeding.

Depot Medroxyprogesterone Acetate (DMPA)

Medroxyprogesterone acetate given by depot injection (DMPA) produces amenorrhea in the majority of women, but some women experience irregular bleeding and side effects such as bloating, weight gain or loss and mood swings. DMPA can be used after abortion (5 days postpartum) or during breastfeeding (6 weeks postpartum). It may be a viable option for women over 35 who smoke and in women who cannot tolerate estrogen. When DMPA is discontinued, ovulation and regular menstrual periods may not resume for up to a year after the last injection. Failure rate is <0.3% per year.³²

A large cross-sectional study of women (18–54 years of age) noted a 7.2% lower spinal bone mineral density (BMD) in users of DMPA than in nonusers. The rate of loss was higher for women who started using DMPA before age 21 and in those using it for longer duration (≥15 years). Because the loss may not be completely reversible, the clinical significance of low BMD, especially in adolescents who have not yet reached peak bone mass, needs to be elucidated.³⁷ Continuous losses at both hip and spine were seen in a small study of adolescent women (14–18 years of age) over 36 months of DMPA use, but significant gains after discontinuation indicate this is likely reversible.³⁸ Small double-blind trials suggest that estrogen supplementation is protective of bone in adolescents who are on DMPA.³⁹

Levonorgestrel Intrauterine System (LNG-IUS)

After insertion of the IUS into the uterus, a low dose of **levonorgestrel** is released continuously over a period of at least 5 years. LNG-IUS is associated with low systemic levels of levonorgestrel and is highly efficacious (≤0.2 pregnancy rate per year¹⁵). It can reduce menstrual blood loss, fibroid growth, dysmenorrhea and endometriosis pain; it may also reduce the risk of developing precancerous cells in the uterus. This method requires a clinician visit for initiation and discontinuation. Twenty to 30% of women will stop having periods while using LNG-IUS. In fibroid-related menorrhagia, menstrual bleeding was reduced by 90% with LNG-IUS compared to a 13% reduction with COCs.⁴⁰ Normal menstruation restarts within 1–3 months of IUS removal.

The most common adverse effect is occasional bleeding or spotting for the first 3 months after insertion. Treatment for LNG-IUS-related spotting with NSAIDs, tranexamic acid or estrogen supplementation has demonstrated mixed results.⁴¹, ⁴² For information on other intrauterine devices, see [Table 3](#).

Risks Associated with Hormonal Contraception

Cardiovascular Risks

Long-term studies are required to quantify cardiovascular risk for users of third-generation combined oral contraceptives (COCs) compared to COCs containing older progestins. All cardiovascular risks are appreciably higher in pregnancy compared to taking low-dose COCs.

Smoking and hypertension increase the risk of ischemic stroke in COC users.⁴³, ⁴⁴, ⁴⁵, ⁴⁶, ⁴⁷ Women who have migraine with aura are at a higher risk of ischemic stroke than women who have migraine without aura.⁴⁶, ⁴⁸, ⁴⁹, ⁵⁰, ⁵¹, ⁵² COC users with migraine and aura who also smoked had a further increase in the risk of stroke.⁵² The risk of stroke does not differ among generations of progestins contained in COCs.⁵³ Consider alternative contraceptive methods in women who suffer from migraines with focal neurologic signs, smoke cigarettes or are hypertensive.¹¹, ¹², ⁵⁴

The risk of MI is compounded in COC users ≥35 years who have other CV disease risk factors such as smoking, hypertension and diabetes³⁷, ⁴³, ⁵⁵, ⁵⁶ and in those whose blood pressure has not been effectively screened.³⁷, ⁴³, ⁴⁴, ⁴⁹, ⁴⁷ Increased risk of MI is associated with increasing number of cigarettes smoked per day.¹¹ No increase in risk of MI is found in women under 35 years of age who have no additional CV risk factors.⁴⁴ A large prospective study of Swedish women aged 30–49 years who used COCs containing <50 µg EE with 11 years of follow-up showed no increased risk of MI compared to nonusers.⁵⁷ Consider alternative contraceptive methods in women >35 years who have additional cardiovascular risk factors.

The risk of venous thromboembolism (VTE) increases with age and with COC use, but to a lesser extent than the increased risk associated with pregnancy.⁵⁸, ⁵⁹, ⁶⁰ The incidence of VTE in women not on oral contraceptives is 0.19–0.37 per 1000 woman years, but this increases to 6–10-fold in pregnancy.⁶⁰ Two large systematic reviews found a 1.5 to 3-fold increased risk of VTE among current COC users compared to nonusers.⁶², ⁶³

The risk of VTE increases with higher estrogen doses⁶⁴, ⁶⁵ but the VTE risk associated with COCs containing 20 µg EE is equivalent

to that of COCs containing 30–35 µg EE.⁵⁰ COCs containing drospirenone^{20, 21, 22} or desogestrel may confer a 50–80% higher VTE risk compared to those containing levonorgestrel.^{61, 62} Non oral hormonal contraception, including the vaginal ring and transdermal patch, may also confer a slightly higher risk of VTE compared to COCs; this risk was not observed with the LNG-IUS.⁶⁶

Inherited hypercoagulable states such as Factor V Leiden mutation, protein C or S deficiency¹¹ or acquired conditions such as immobility, trauma or surgery are associated with an increased risk of VTE. Obese COC users are at an increased risk of VTE compared to obese nonusers.^{67, 68} Women with Factor V Leiden who use COCs experience a VTE risk 30 times higher than that of COC users without the mutation.^{64, 69, 70} Broad-based screening for this or other thrombophilias (protein C or S deficiency) is not appropriate because of the rarity of these conditions and the high screening costs. If there is a strong family or personal history of VTE, screening is recommended.^{71, 72} COCs are contraindicated in women with a history of VTE and hypercoagulable states.

In summary, the risk of CV disease in nonsmoking normotensive women under the age of 35 is so small that there is no health impact related to the choice of a second- versus third-generation progestin. Individualize COC selection based on history, also considering noncontraceptive benefits, and control the individual's risk factors for CV disease such as obesity, smoking and hypertension.

Breast Cancer Risk

The effect of COCs on the risk of breast cancer is controversial. Studies of COC use and breast cancer find no overall risk or a slight increase in risk.¹² In women under the age of 35, the baseline risk is 2 in 1000. COC use increases the risk 1.5 to 3-fold in 1000. As women age the risk increases. One of the risk factors for breast cancer is not having a baby by the age of 25. It is uncertain whether the risk is associated with use of a COC or the delay in pregnancy. In women with a positive family history of breast cancer, COC use has been associated with increase in baseline risk;⁷³ thus early screening is advised.

A prospective study that followed 116 608 female nurses from 1989–2001 found that past use of OCs was not associated with an increased risk of breast cancer. Current use conferred a small increase in relative risk (RR 1.33 95% CI 1.03–1.73).⁷⁴

Management of Breakthrough Bleeding

Breakthrough bleeding is a common and self-resolving adverse effect of hormonal contraceptive therapy, occurring within the first 3–6 months of treatment.⁸⁵ Causes of breakthrough bleeding include pregnancy, STIs, nonadherence to contraceptives, drug interactions, smoking, abnormal cervical cytology and pre-existing gynecological problems. Progestin-only contraceptives and COCs with 20–25 µg EE are associated with more breakthrough bleeding than other oral contraceptive methods.¹⁷

Management of breakthrough bleeding should not be attempted until after at least 3 months of therapy. COC-related breakthrough bleeding may be managed by increasing the dose to a maximum of 35 µg EE or the changing type of progestin in the COC.^{85, 86} Preliminary studies indicate that progestin-only-related breakthrough bleeding may be managed with supplemental estrogen or COCs, NSAIDs, tranexamic acid, mifepristone/estrogen and doxycycline.^{86, 87}

HIV and Contraception

Correct and consistent use of latex male condoms is the most effective way to reduce risk of acquisition and transmission of HIV. Regardless of formulation or dosage, spermicides containing nonoxynol-9 do not provide any protection against HIV.^{88, 89}

Copper-IUDs do not confer a greater risk of acquiring HIV than if no contraceptive method is used.⁸⁸ Although there is concern about the theoretical risk of pelvic infection in women with HIV/AIDS who use IUDs and about transmission to uninfected partners, evidence is lacking. People who engage in sexual intercourse with partners who may be HIV-infected should consistently and correctly use latex condoms regardless of other contraceptive methods used.

No studies of hormone use have directly addressed whether COC use enhances disease progression in women with HIV/AIDS. For women at high risk of contracting HIV, evidence showing any increase in that risk for COC users compared to nonusers is inconsistent. For women infected with HIV, evidence is limited but there appears to be no correlation between COC use and changes in CD4 counts or RNA levels.⁹⁰ Some antiretroviral drugs may interact with OCs (see [Table 4](#)). There is no strong evidence of association between use of OCs or DMPA and HIV infection.^{37, 91}

Emergency Postcoital Contraception

A single dose of **levonorgestrel** 1.5 mg used within 24 hours of unprotected intercourse prevents 95% of expected pregnancies.⁷⁵ However, the efficacy of levonorgestrel may be reduced with increased BMI.⁷⁶ Recently, Health Canada issued an advisory warning that levonorgestrel emergency contraceptives are less effective in women weighing 75–80 kg and ineffective in women weighing

more than 80 kg.⁷⁷ Additionally, efficacy is highest if treatment is provided within 24 hours; it can be taken up to 5 days after unprotected intercourse though the effectiveness declines with increasing delay between unprotected intercourse and treatment initiation.⁷⁸ Unprotected intercourse is defined as no contraceptive method used, condom breakage, more than 2 OC-pills missed any time during the cycle, 1 pill missed in the first week, more than 7-day pill-free interval, more than 13-weeks interval between DMPA injections, ejaculation on external genitalia or sexual assault.

Levonorgestrel emergency contraception (EC) has a good safety record. There was no diagnosis of DVT or PE within 45 days of the prescription in a large UK study of EC users.⁷⁹ Side effects include nausea, vomiting, dizziness and fatigue. EC has no effect on an established postimplantation pregnancy.

Postcoital insertion of a **copper IUD** can be considered up to 7 days after unprotected intercourse. Prior to insertion, it is important to exclude pre-existing pregnancy. A meta-analysis demonstrated a failure rate of 0.1% from more than 8400 insertions of postcoital IUDs.^{80, 81} Though the exact mechanism of action is unknown, copper is postulated to impair implantation.⁸² In addition to a high efficacy rate, the copper IUD is the only method to provide ongoing contraception to prevent future need for emergency contraception.⁸⁴

See [Table 5](#) for more information on emergency contraceptive choices.

Contraceptive Choices during Breastfeeding and the Postpartum Period

After delivery, it is highly unpredictable when fertility will be restored in breastfeeding mothers. Within 6 weeks of delivery there can be ovulation and pregnancy and these issues can be addressed at the postpartum visit. If coitus has resumed before the 6 week visit, exclude pregnancy before initiating a hormonal method of contraception.

Breastfeeding does not provide reliable contraceptive efficacy without a back up barrier method or alternative, as lactational amenorrhea is difficult to maintain (depends on the mother ensuring consistent, exclusive breastfeeding, with no supplemental food or fluids given; additionally, menses must not have returned and the baby must be <6 months old).

Barrier methods and **spermicide** can provide lubrication to the hypoestrogenic vagina but are not as effective for contraception as other methods.

The current Canadian Contraception Consensus guidelines recommend progestin-only methods of contraception in postpartum mothers regardless of breastfeeding status.³² These methods can be introduced immediately after delivery. Since expulsion rates are higher for LNG-IUS when inserted immediately postpartum compared to 6 weeks after delivery, guidelines recommend waiting before insertion.³² However, immediate insertion appears to be safe and effective, and provides convenience and assurance of contraception postpartum [SORT B].^{92,93} Useful Info?

Progestin-based methods are recommended during breastfeeding due to the reduced risk of thromboembolism in the puerperium and their neutral effect on milk supply and establishment of breastfeeding. There is limited evidence of safety with regards to growth, health and development of infants exposed to progestin-only oral contraceptives. Oral formulations must be taken every day at the same time, without missing a pill, to minimize spotting and maintain contraceptive efficacy.

Avoid use of **COCs** in the first 6 weeks postpartum due to an increase in thrombotic risk in this period related to coagulation changes of the puerperium. There is also a concern about establishing an adequate milk supply. There are insufficient data to establish an effect of hormonal contraception on milk quality or quantity.⁹⁴

An IUD⁹⁵ or COCs may be started immediately after first trimester abortion or loss.

An IUD can be inserted immediately⁹⁶ or up to 6 weeks postpartum once involution has occurred and the uterus is firm enough to minimize the risk of insertional perforation. Ensure good fundal placement; this can be difficult in the immediate postpartum state with the larger uterine cavity.

Therapeutic Tips

- Hormonal contraceptives help regulate cycles and decrease menstrual flow. This may help to control anemia in women with heavy or irregular periods. In nonsmoking women with no cardiovascular risk factors, COCs may be considered for contraception or control of dysfunctional uterine bleeding until menopause. For more information, see [Sexual Health: Dysmenorrhea](#).
- Noncontraceptive health benefits attributed to hormonal contraceptives use include a decrease in the frequency of fibroids, endometriosis pain, benign breast disease, functional ovarian cysts, ectopic pregnancy, dysmenorrhea, pelvic inflammatory disease and perimenopausal symptoms. COC use is also associated with a reduced incidence of endometrial and ovarian cancers compared to nonusers.¹⁵ For more information, see [Sexual Health: Endometriosis](#).
- Hormonal contraception does not protect against acquisition of sexually transmitted infections. Educate patients on use of male latex condoms.
- Long-acting reversible contraception (LNG-IUS or copper-IUD) is the preferred form of contraception in adolescents at high risk

of contraception failure due to incorrect use.^{97, 98} These devices are safe for use in nulliparous adolescents.⁹⁹

Drug Tables

Table 3: Nonhormonal Contraceptive Methods

| Class | Contraceptive Method | Contraindications | Adverse Effects | Comments | Cost ^a |
|-----------------|---|---|---|---|-------------------------|
| Barrier Methods | <i>cervical cap</i> FemCap | Absolute: cervical deformity (inability to obtain suitable fit), current PID, current vaginal or cervical infection, cervical or uterine cancer, cervical intraepithelial neoplasia, recurrent vaginal, urinary tract or cervical infections. Relative: abnormal cervical cytology, chronic cervicitis, recurrent salpingitis. Postpartum use unsuitable prior to uterine involution. | Common: vaginal discharge, vaginal odour, cervical or fornices ulceration, hypersensitivity (cap or spermicide). Infection if not used/cleaned properly, vaginitis. Rare: toxic shock syndrome. | Failure rate: <u>b</u> , <u>1</u> Typical use: 20% (nulliparous), 40% (parous). Perfect use: 9% (nulliparous), 26% (parous). Can be left in place for up to 48 h for multiple acts of intercourse. Use with spermicide, placed inside cap prior to insertion. Can be used in breastfeeding women (not within 6 wk of delivery). Manufacturer recommends refitting after miscarriage, term delivery, abortion, or if lose/gain ≥ 3 kg. | \$90/cap |
| Barrier Methods | <i>condoms, male</i> (<i>latex, polyurethane, lambskin</i>) Trojan, Lifestyles, various | Relative: hypersensitivity to latex, polyurethane, or lanolin (in case of lambskin condoms). | Common: hypersensitivity to latex in either partner (may use polyurethane type). | Failure rate: <u>b</u> , <u>2</u> Typical use: 18%. Perfect use: 2%. Protects against STI including HIV (except lambskin condoms which do <i>not</i> protect against STI); best suited to infrequent intercourse; may use with a separately provided vaginal spermicide; check expiry date; latex condom integrity is degraded by miconazole and oil-based lubricants (use water-based lubricants). | \$0.35–1.00/male condom |
| Barrier Methods | <i>condoms, female</i> (<i>polyurethane</i>) FC 2 | Relative: hypersensitivity to polyurethane, vaginal anatomical abnormalities that make fitting difficult. | Discomfort. | Failure rate: <u>b</u> , <u>2</u> Typical use: 21%. Perfect use: 5%. Inserted up to 8 h prior to intercourse and removed immediately after. Not to be used with male condoms, potential for displacement; best suited for women who find | \$2.00/female condom |

| Class | Contraceptive Method | Contraindications | Adverse Effects | Comments | Cost ^a |
|----------------------------|---|---|---|---|-------------------------------------|
| | | | | <p>spermicide irritating or who dislike messiness of other vaginal barrier methods; shelf-life of up to 5 y.</p> <p>This product is not available in pharmacies; may need to be purchased from sexual health clinics (e.g., Planned Parenthood).</p> | |
| Barrier Methods | <i>diaphragm, silicone</i> Wide Seal, Caya | Absolute: inability to achieve proper fit, marked uterine prolapse, large cystocele/rectocele, vaginal deformity, recurrent UTI. Relative: hypersensitivity, inability to insert. Postpartum use unsuitable prior to uterine involution. | <p>Common: hypersensitivity to diaphragm and/or spermicide. Infection if diaphragm not used/cleaned properly.</p> <p>Less common: increased incidence of UTI</p> <p>Rare: toxic shock syndrome.</p> | <p>Failure rate: $\frac{b}{-}$, $\frac{2}{-}$ Typical use: 12%. Perfect use: 6%.</p> <p>Best suited to infrequent intercourse. Use with spermicide. Can be inserted 6 h before intercourse.</p> <p>Refit after childbirth, surgery, or if lose/gain ≥ 4 kg.</p> <p>Can be used in breastfeeding women.</p> | \$55/diaphragm |
| Barrier Methods | <i>sponge</i> Today Sponge | Absolute: inability to achieve proper fit, recurrent UTI. Relative: hypersensitivity, inability to insert. | <p>Common: hypersensitivity. Rare: toxic shock syndrome.</p> | <p>Failure rate: $\frac{b}{-}$, $\frac{2}{-}$ Typical use: 12% (nulliparous), 24% (parous). Perfect use: 9% (nulliparous), 20% (parous).</p> <p>Spermicide is released in a sustained fashion for up to 12 h. May increase HIV transmission by damaging vaginal mucosa; in women at high risk of HIV infection, this risk must be balanced against risk of pregnancy.</p> <p>Do not use during menstruation.³</p> | \$6/unit |
| Intrauterine Devices (IUD) | <i>copper-T IUD</i> Nova-T, Flexi-T | Absolute: pregnancy, undiagnosed vaginal bleeding, stenosed cervix, copper allergy, current PID or STI, cervical or endometrial cancer, copper allergy, inability to place or retain device. ⁷ Relative: 2–28 days postpartum (to decrease | Major: salpingitis, uterine perforation, cervical perforation, endometrial embedding, menorrhagia, pain, infection, ectopic pregnancy. | <p>Failure rate: $\frac{b}{-}$, $\frac{2}{-}$ 0.6–0.8%. Excellent for spacing children in a stable relationship; risk of PID and tubal infections; immediate risks are insertional infection or perforation; late risks are infection and ectopic</p> | \$70–180 (lasts 3–10y) ⁵ |

| Class | Contraceptive Method | Contraindications | Adverse Effects | Comments | Cost ^a |
|-------------------------|--|--|---|--|---------------------------------|
| | | risk of expulsion). ⁸ | | pregnancy. May be used post abortion. Although AHA guidelines suggest it is no longer mandatory to use endocarditis prophylaxis for IUD insertion in women with complicated valvular heart disease, clinical judgment should be used based on the complexity of the heart lesion. | |
| Natural Methods | <i>coital timing</i> | Relative: irregular cycle. | None. | Failure rate: $\frac{b}{-}$, $\frac{2}{-}$ Typical use: 24%. Perfect use: 0.4–5%. Fertility awareness methods require high motivation; depends on identification of mucus and temperature patterns to identify fertile time; very difficult if there is an irregular cycle or ovulation defects; high pregnancy rates. | None |
| Spermicides | <i>nonoxynol-9</i> Vaginal Contraceptive Film (VCF), others | Relative: hypersensitivity. | Common: hypersensitivity. | Failure rate: $\frac{b}{-}$, $\frac{2}{-}$ (when used alone) Typical use: 28%. Perfect use: 18%. Not effective against HIV or STI. Increased risk of HIV transmission due to increased risk of genital lesions with regular use; ⁴ in women at high risk of HIV infection, this risk must be balanced against risk of pregnancy. | \$1/unit |
| Sterilization, Surgical | <i>tubal ligation</i> | Pregnancy, systemic conditions (e.g., cardiopulmonary) that can be aggravated by general anesthesia, pelvic infection. | Cumulative 10-year probability of ectopic pregnancy post tubal ligation: 7.3 per 1000. ⁹ | Failure rate: $\frac{b}{-}$, $\frac{2}{-}$ 0.5%. Method of choice for couples with completed family. Reversible only if salpingectomy not performed and sufficient length of undamaged tubal remnants remain. Cost of reversal surgery \$3000–5000. | Cost-insured service in Canada. |

| Class | Contraceptive Method | Contraindications | Adverse Effects | Comments | Cost ^a |
|-------------------------|----------------------|---|---|---|---------------------------------|
| Sterilization, Surgical | <i>vasectomy</i> | Systemic conditions (e.g., acute infectious diseases), local infection, sexual dysfunction, local genital abnormalities (e.g., hernia). | Local pain, scrotal ecchymosis, swelling. | Failure rate: <u> </u> ^b , <u> </u> ² 0.1–0.15%. Method of choice for couples with completed family; reversible with more surgery if <10 y since procedure. Cost of reversal surgery \$3000–5000. | Cost-insured service in Canada. |

a. Approximate cost per unit (condom, tube, canister, package); includes drug or contraceptive cost only. Mark-up is not included.

b. Percentage of women with unintended pregnancy within 1st year of use.

Abbreviations: HIV=human immunodeficiency virus; IUD=intrauterine device; PID=pelvic inflammatory disease ; STI=sexually transmitted infection; UTI=urinary tract infection

Table 4: Hormonal Contraceptive Methods

| Class | Drug | Contraindications | Adverse Effects | Drug Interactions | Comments | Cost ^a |
|---|--|--|---|---|--|-------------------|
| Contraceptives, oral – combined estrogen (35 µg EE) and progestin, Monophasic | <i>EE 35 µg/norethindrone 1 mg</i> Brevicon 1/35 , Ortho 1/35 , Select 1/35 | Absolute: history of MI or ischemic heart disease, cerebrovascular disease, complicated valvular heart disease, current or past history of VTE, known thrombogenic mutation, severe cirrhosis, liver tumour, breast cancer, diabetes with microvascular complications, migraines with aura, <6 wk postpartum if breastfeeding, smoker >35 y (≥15 cigarettes/day), hypertension (systolic BP ≥ 160 mm Hg or diastolic BP ≥100 mm Hg), known coagulation-factor deficiency. ¹¹ Relative: estrogen hypersensitivity, migraine, gallbladder disease, high BMI/weight. Low-dose COCs are relatively contraindicated if BP ≥140/90. | Major: thromboembolism (rare), stroke, retinal artery thrombosis, MI, benign liver tumour, cholelithiasis, hypertension. Watch for danger signals: ACHES— a bdominal pain, c hest pain, h eadaches, e ye problems, s evere leg pain. Advise patient to consult physician. Common: breakthrough bleeding/spotting, amenorrhea, nausea/vomiting, bloating, chloasma, breast tenderness, mood changes such as depression, headaches. | May increase cyclosporine levels or hepatotoxicity; may decrease lamotrigine levels. Significant pharmacokinetic interaction with rifampin, griseofulvin (advise backup barrier method during therapy). Monitor INR with concurrent oral anticoagulant use. Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease EE/progestin serum concentrations. Reports of COC failure with concomitant ampicillin, amoxicillin, tetracycline, erythromycin, sulfamethoxazole/trimethoprim or nitrofurantoin. | Failure rate: <u> </u> ^b , <u> </u> ² Typical use: 9%. Perfect use: 0.3%. Lower-dose COCs are method of choice for most young couples, especially for teens, if combined with condoms; products with lower dose of EE have increased safety, decreased side effects; condoms needed for STI protection. Patients with diarrhea or breakthrough bleeding may be at higher risk of contraceptive failure. | \$ |

| Class | Drug | Contraindications | Adverse Effects | Drug Interactions | Comments | Cost ^a |
|---|--|--|---|---|--|-------------------|
| Contraceptives, oral – combined estrogen (35 µg EE) and progestin, Monophasic | <i>EE 35 µg/norethindrone 0.5 mg</i> Brevicon 0.5/35 , Ortho 0.5/35 | Absolute: history of MI or ischemic heart disease, cerebrovascular disease, complicated valvular heart disease, current or past history of VTE, known thrombogenic mutation, severe cirrhosis, liver tumour, breast cancer, diabetes with microvascular complications, migraines with aura, <6 wk postpartum if breastfeeding, smoker >35 y (≥15 cigarettes/day), hypertension (systolic BP ≥ 160 mm Hg or diastolic BP ≥100 mm Hg), known coagulation-factor deficiency. ¹¹ Relative: estrogen hypersensitivity, migraine, gallbladder disease, high BMI/weight. Low-dose COCs are relatively contraindicated if BP ≥140/90. | Major: thromboembolism (rare), stroke, retinal artery thrombosis, MI, benign liver tumour, cholelithiasis, hypertension. Watch for danger signals: ACHES— ab dominal pain, ch est pain, h eadaches, e ye problems, s evere leg pain. Advise patient to consult physician. Common: breakthrough bleeding/spotting, amenorrhea, nausea/vomiting, bloating, chloasma, breast tenderness, mood changes such as depression, headaches. | May increase cyclosporine levels or hepatotoxicity; may decrease lamotrigine levels. Significant pharmacokinetic interaction with rifampin, griseofulvin (advise backup barrier method during therapy). Monitor INR with concurrent oral anticoagulant use. Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease EE/progestin serum concentrations. Reports of COC failure with concomitant ampicillin, amoxicillin, tetracycline, erythromycin, sulfamethoxazole/trimethoprim or nitrofurantoin. | Failure rate: b , 2 Typical use: 9%. Perfect use: 0.3%. Lower-dose COCs are method of choice for most young couples, especially for teens, if combined with condoms; products with lower dose of EE have increased safety, decreased side effects; condoms needed for STI protection. Patients with diarrhea or breakthrough bleeding may be at higher risk of contraceptive failure. | \$\$ |
| Contraceptives, oral – combined estrogen (35 µg EE) and progestin, Monophasic | <i>EE 35 µg/norgestimate 0.25 mg</i> CycLEN | Absolute: history of MI or ischemic heart disease, cerebrovascular disease, complicated valvular heart disease, current or past history of VTE, known thrombogenic mutation, severe cirrhosis, liver tumour, breast cancer, diabetes with microvascular complications, migraines with aura, <6 wk postpartum if breastfeeding, smoker >35 y (≥15 cigarettes/day), hypertension (systolic BP ≥ 160 mm Hg or | Major: thromboembolism (rare), stroke, retinal artery thrombosis, MI, benign liver tumour, cholelithiasis, hypertension. Watch for danger signals: ACHES— ab dominal pain, ch est pain, h eadaches, e ye problems, s evere leg pain. Advise patient to consult physician. Common: breakthrough bleeding/spotting, amenorrhea, nausea/vomiting, bloating, | May increase cyclosporine levels or hepatotoxicity; may decrease lamotrigine levels. Significant pharmacokinetic interaction with rifampin, griseofulvin (advise backup barrier method during therapy). Monitor INR with concurrent oral anticoagulant use. Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. | Failure rate: b , 2 Typical use: 9%. Perfect use: 0.3%. Lower-dose COCs are method of choice for most young couples, especially for teens, if combined with condoms; products with lower dose of EE have increased safety, decreased side effects; | \$\$\$ |

| Class | Drug | Contraindications | Adverse Effects | Drug Interactions | Comments | Cost ^a |
|--|---|---|--|--|---|-------------------|
| | | <p>diastolic BP \geq100 mm Hg), known coagulation-factor deficiency.¹¹ Relative: estrogen hypersensitivity, migraine, gallbladder disease, high BMI/weight.</p> <p>Low-dose COCs are relatively contraindicated if BP \geq140/90.</p> | <p>chloasma, breast tenderness, mood changes such as depression, headaches.</p> | <p>John's wort, topiramate may decrease EE/progestin serum concentrations.</p> <p>Reports of COC failure with concomitant ampicillin, amoxicillin, tetracycline, erythromycin, sulfamethoxazole/trimethoprim or nitrofurantoin.</p> | <p>condoms needed for STI protection.</p> <p>Patients with diarrhea or breakthrough bleeding may be at higher risk of contraceptive failure.</p> | |
| Contraceptives, oral – combined estrogen (30 μ g EE) and progestin, Monophasic | <p>EE 30 μg/desogestrel 0.15 mg Marvelon, Ortho-Cept, Apri, Freya, Mirvala</p> | <p>Absolute: history of MI or ischemic heart disease, cerebrovascular disease, complicated valvular heart disease, current or past history of VTE, known thrombogenic mutation, severe cirrhosis, liver tumour, breast cancer, diabetes with microvascular complications, migraines with aura, <6 wk postpartum if breastfeeding, smoker >35 y (\geq15 cigarettes/day), hypertension (systolic BP \geq 160 mm Hg or diastolic BP \geq100 mm Hg), known coagulation-factor deficiency.¹¹ Relative: estrogen hypersensitivity, migraine, gallbladder disease, high BMI/weight.</p> <p>Low-dose COCs are relatively contraindicated if BP \geq140/90.</p> | <p>Major: thromboembolism (rare), stroke, retinal artery thrombosis, MI, benign liver tumour, cholelithiasis, hypertension. Watch for danger signals: ACHES—abdominal pain, chest pain, headaches, eye problems, severe leg pain. Advise patient to consult physician.</p> <p>Common: breakthrough bleeding/spotting, amenorrhea, nausea/vomiting, bloating, chloasma, breast tenderness, mood changes such as depression, headaches.</p> | <p>May increase cyclosporine levels or hepatotoxicity; may decrease lamotrigine levels. Significant pharmacokinetic interaction with rifampin, griseofulvin (advise backup barrier method during therapy).</p> <p>Monitor INR with concurrent oral anticoagulant use.</p> <p>Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease EE/progestin serum concentrations.</p> <p>Reports of COC failure with concomitant ampicillin, amoxicillin, tetracycline, erythromycin, sulfamethoxazole/trimethoprim or nitrofurantoin.</p> | <p>Failure rate: b , 2 Typical use: 9%. Perfect use: 0.3%. Lower-dose COCs are method of choice for most young couples, especially for teens, if combined with condoms; products with lower dose of EE have increased safety, decreased side effects; condoms needed for STI protection. Patients with diarrhea or breakthrough bleeding may be at higher risk of contraceptive failure.</p> | \$ |
| Contraceptives, oral – combined estrogen (30 μ g EE) and | <p>EE 30 μg/drospirenone 3 mg Yasmin, Zamine, Zarah</p> | <p>Absolute: history of MI or ischemic heart disease, cerebrovascular disease,</p> | <p>Major: thromboembolism (rare), stroke, retinal artery thrombosis, MI,</p> | <p>May increase cyclosporine levels or hepatotoxicity; may decrease</p> | <p>Failure rate: b , 2 Typical use: 9%.</p> | \$\$ |

| Class | Drug | Contraindications | Adverse Effects | Drug Interactions | Comments | Cost ^a |
|---|---|---|---|---|---|-------------------|
| progestin, Monophasic | | <p>complicated valvular heart disease, current or past history of VTE, known thrombogenic mutation, severe cirrhosis, liver tumour, breast cancer, diabetes with microvascular complications, migraines with aura, <6 wk postpartum if breastfeeding, smoker >35 y (≥15 cigarettes/day), hypertension (systolic BP ≥ 160 mm Hg or diastolic BP ≥100 mm Hg), known coagulation-factor deficiency.¹¹ Relative: estrogen hypersensitivity, migraine, gallbladder disease, high BMI/weight.</p> <p>Low-dose COCs are relatively contraindicated if BP ≥140/90.</p> | <p>benign liver tumour, cholelithiasis, hypertension. Watch for danger signals: ACHES—abdominal pain, chest pain, headaches, eye problems, severe leg pain. Advise patient to consult physician.</p> <p>Common: breakthrough bleeding/spotting, amenorrhea, nausea/vomiting, bloating, chloasma, breast tenderness, mood changes such as depression, headaches.</p> <p>Risk of hyperkalemia in patients prone to increased K⁺ (e.g., renal disease, concomitant ACEI, ARB, potassium-sparing diuretics, NSAID). Check K⁺ after 1st cycle.</p> <p>May increase risk of VTE compared to LNG-containing OCs.</p> | <p>lamotrigine levels. Significant pharmacokinetic interaction with rifampin, griseofulvin (advise backup barrier method during therapy).</p> <p>Monitor INR with concurrent oral anticoagulant use.</p> <p>Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease EE/progestin serum concentrations.</p> <p>Reports of COC failure with concomitant ampicillin, amoxicillin, tetracycline, erythromycin, sulfamethoxazole/trimethoprim or nitrofurantoin.</p> | <p>Perfect use: 0.3%.</p> <p>Lower-dose COCs are method of choice for most young couples, especially for teens, if combined with condoms; products with lower dose of EE have increased safety, decreased side effects; condoms needed for STI protection.</p> <p>Patients with diarrhea or breakthrough bleeding may be at higher risk of contraceptive failure.</p> <p>Also indicated for acne treatment.</p> | |
| Contraceptives, oral – combined estrogen (30 µg EE) and progestin, Monophasic | <p><i>EE 30 µg/ethynodiol diacetate 2 mg</i> Demulen 30</p> | <p>Absolute: history of MI or ischemic heart disease, cerebrovascular disease, complicated valvular heart disease, current or past history of VTE, known thrombogenic mutation, severe cirrhosis, liver tumour, breast cancer, diabetes with microvascular complications, migraines with aura, <6 wk postpartum if breastfeeding, smoker >35 y (≥15 cigarettes/day),</p> | <p>Major: thromboembolism (rare), stroke, retinal artery thrombosis, MI, benign liver tumour, cholelithiasis, hypertension. Watch for danger signals: ACHES—abdominal pain, chest pain, headaches, eye problems, severe leg pain. Advise patient to consult physician.</p> <p>Common: breakthrough bleeding/spotting,</p> | <p>May increase cyclosporine levels or hepatotoxicity; may decrease lamotrigine levels. Significant pharmacokinetic interaction with rifampin, griseofulvin (advise backup barrier method during therapy).</p> <p>Monitor INR with concurrent oral anticoagulant use.</p> <p>Carbamazepine, modafinil, phenytoin,</p> | <p>Failure rate: ^b <u> </u>, <u> </u> <u> </u></p> <p>Typical use: 9%.</p> <p>Perfect use: 0.3%.</p> <p>Lower-dose COCs are method of choice for most young couples, especially for teens, if combined with condoms; products with lower dose of EE have increased</p> | <p>\$\$</p> |

| Class | Drug | Contraindications | Adverse Effects | Drug Interactions | Comments | Cost ^a |
|--|--|--|--|--|--|-------------------|
| | | <p>hypertension (systolic BP \geq 160 mm Hg or diastolic BP \geq 100 mm Hg), known coagulation-factor deficiency.¹¹ Relative: estrogen hypersensitivity, migraine, gallbladder disease, high BMI/weight.</p> <p>Low-dose COCs are relatively contraindicated if BP \geq 140/90.</p> | <p>amenorrhea, nausea/vomiting, bloating, chloasma, breast tenderness, mood changes such as depression, headaches.</p> | <p>protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease EE/progestin serum concentrations.</p> <p>Reports of COC failure with concomitant ampicillin, amoxicillin, tetracycline, erythromycin, sulfamethoxazole/trimethoprim or nitrofurantoin.</p> | <p>safety, decreased side effects; condoms needed for STI protection.</p> <p>Patients with diarrhea or breakthrough bleeding may be at higher risk of contraceptive failure.</p> | |
| Contraceptives, oral – combined estrogen (30 μ g EE) and progestin, Monophasic | <p>EE 30 μg/levonorgestrel 0.15 mg, 1-month Min-Ovral, Portia</p> | <p>Absolute: history of MI or ischemic heart disease, cerebrovascular disease, complicated valvular heart disease, current or past history of VTE, known thrombogenic mutation, severe cirrhosis, liver tumour, breast cancer, diabetes with microvascular complications, migraines with aura, <6 wk postpartum if breastfeeding, smoker >35 y (\geq 15 cigarettes/day), hypertension (systolic BP \geq 160 mm Hg or diastolic BP \geq 100 mm Hg), known coagulation-factor deficiency.¹¹ Relative: estrogen hypersensitivity, migraine, gallbladder disease, high BMI/weight.</p> <p>Low-dose COCs are relatively contraindicated if BP \geq 140/90.</p> | <p>Major: thromboembolism (rare), stroke, retinal artery thrombosis, MI, benign liver tumour, cholelithiasis, hypertension. Watch for danger signals: ACHES—abdominal pain, chest pain, headaches, eye problems, severe leg pain. Advise patient to consult physician.</p> <p>Common: breakthrough bleeding/spotting, amenorrhea, nausea/vomiting, bloating, chloasma, breast tenderness, mood changes such as depression, headaches.</p> | <p>May increase cyclosporine levels or hepatotoxicity; may decrease lamotrigine levels. Significant pharmacokinetic interaction with rifampin, griseofulvin (advise backup barrier method during therapy).</p> <p>Monitor INR with concurrent oral anticoagulant use.</p> <p>Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease EE/progestin serum concentrations.</p> <p>Reports of COC failure with concomitant ampicillin, amoxicillin, tetracycline, erythromycin, sulfamethoxazole/trimethoprim or nitrofurantoin.</p> | <p>Failure rate: b, 2 Typical use: 9%. Perfect use: 0.3%. Lower-dose COCs are method of choice for most young couples, especially for teens, if combined with condoms; products with lower dose of EE have increased safety, decreased side effects; condoms needed for STI protection. Patients with diarrhea or breakthrough bleeding may be at higher risk of contraceptive failure.</p> | \$\$ |

| Class | Drug | Contraindications | Adverse Effects | Drug Interactions | Comments | Cost ^a |
|---|--|--|--|---|---|-------------------|
| Contraceptives, oral – combined estrogen (30 µg EE) and progestin, Monophasic | EE 30 µg/levonorgestrel 0.15 mg, 3-month Seasonale , Seasonique | Absolute: history of MI or ischemic heart disease, cerebrovascular disease, complicated valvular heart disease, current or past history of VTE, known thrombogenic mutation, severe cirrhosis, liver tumour, breast cancer, diabetes with microvascular complications, migraines with aura, <6 wk postpartum if breastfeeding, smoker >35 y (≥15 cigarettes/day), hypertension (systolic BP ≥ 160 mm Hg or diastolic BP ≥100 mm Hg), known coagulation-factor deficiency. ¹¹ Relative: estrogen hypersensitivity, migraine, gallbladder disease, high BMI/weight. Low-dose COCs are relatively contraindicated if BP ≥140/90. | Major: thromboembolism (rare), stroke, retinal artery thrombosis, MI, benign liver tumour, cholelithiasis, hypertension. Watch for danger signals: ACHES— ab dominal pain, ch est pain, h eadaches, e ye problems, s evere leg pain. Advise physician. Common: breakthrough bleeding/spotting, amenorrhea, nausea/vomiting, bloating, chloasma, breast tenderness, mood changes such as depression, headaches. | May increase cyclosporine levels or hepatotoxicity; may decrease lamotrigine levels. Significant pharmacokinetic interaction with rifampin, griseofulvin (advise backup barrier method during therapy). Monitor INR with concurrent oral anticoagulant use. Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease EE/progestin serum concentrations. Reports of COC failure with concomitant ampicillin, amoxicillin, tetracycline, erythromycin, sulfamethoxazole/trimethoprim or nitrofurantoin. | Failure rate: <u>b</u> , <u>2</u> Typical use: 9%. Perfect use: 0.3%. Lower-dose COCs are method of choice for most young couples, especially for teens, if combined with condoms; products with lower dose of EE have increased safety, decreased side effects; condoms needed for STI protection. Patients with diarrhea or breakthrough bleeding may be at higher risk of contraceptive failure. Seasonale and Seasonique are packaged for 3 months of continuous use, with 84 active tablets and 7 inert (Seasonale) or ultra-low dose (0.01 mg) EE tablets (Seasonique). | \$59/ 3 months |
| Contraceptives, oral – combined estrogen (30 µg EE) and progestin, Monophasic | EE 30 µg/norethindrone acetate 1.5 mg Loestrin 1.5/30 | Absolute: history of MI or ischemic heart disease, cerebrovascular disease, complicated valvular heart disease, current or past history of VTE, known thrombogenic mutation, severe cirrhosis, liver tumour, breast cancer, diabetes with microvascular | Major: thromboembolism (rare), stroke, retinal artery thrombosis, MI, benign liver tumour, cholelithiasis, hypertension. Watch for danger signals: ACHES— ab dominal pain, ch est pain, h eadaches, e ye problems, s evere leg pain. Advise | May increase cyclosporine levels or hepatotoxicity; may decrease lamotrigine levels. Significant pharmacokinetic interaction with rifampin, griseofulvin (advise backup barrier method during therapy). Monitor INR with | Failure rate: <u>b</u> , <u>2</u> Typical use: 9%. Perfect use: 0.3%. Lower-dose COCs are method of choice for most young couples, especially for teens, if | \$\$ |

| Class | Drug | Contraindications | Adverse Effects | Drug Interactions | Comments | Cost ^a |
|---|--|--|---|--|---|-------------------|
| | | <p>complications, migraines with aura, <6 wk postpartum if breastfeeding, smoker >35 y (≥15 cigarettes/day), hypertension (systolic BP ≥ 160 mm Hg or diastolic BP ≥100 mm Hg), known coagulation-factor deficiency.¹¹</p> <p>Relative: estrogen hypersensitivity, migraine, gallbladder disease, high BMI/weight.</p> <p>Low-dose COCs are relatively contraindicated if BP ≥140/90.</p> | <p>patient to consult physician.</p> <p>Common: breakthrough bleeding/spotting, amenorrhea, nausea/vomiting, bloating, chloasma, breast tenderness, mood changes such as depression, headaches.</p> | <p>concurrent oral anticoagulant use.</p> <p>Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease EE/progestin serum concentrations.</p> <p>Reports of COC failure with concomitant ampicillin, amoxicillin, tetracycline, erythromycin, sulfamethoxazole/trimethoprim or nitrofurantoin.</p> | <p>combined with condoms; products with lower dose of EE have increased safety, decreased side effects; condoms needed for STI protection.</p> <p>Patients with diarrhea or breakthrough bleeding may be at higher risk of contraceptive failure.</p> | |
| Contraceptives, oral – combined estrogen (20 µg EE) and progestin, Monophasic | <i>EE 20 µg/drospirenone 3 mg</i> Yaz | <p>Absolute: history of MI or ischemic heart disease, cerebrovascular disease, complicated valvular heart disease, current or past history of VTE, known thrombogenic mutation, severe cirrhosis, liver tumour, breast cancer, diabetes with microvascular complications, migraines with aura, <6 wk postpartum if breastfeeding, smoker >35 y (≥15 cigarettes/day), hypertension (systolic BP ≥ 160 mm Hg or diastolic BP ≥100 mm Hg), known coagulation-factor deficiency.¹¹</p> <p>Relative: estrogen hypersensitivity, migraine, gallbladder disease, high BMI/weight.</p> <p>Low-dose COCs are relatively contraindicated if BP ≥140/90.</p> | <p>Major: thromboembolism (rare), stroke, retinal artery thrombosis, MI, benign liver tumour, cholelithiasis, hypertension. Watch for danger signals: ACHES—abdominal pain, chest pain, headaches, eye problems, severe leg pain. Advise patient to consult physician.</p> <p>Common: breakthrough bleeding/spotting, amenorrhea, nausea/vomiting, bloating, chloasma, breast tenderness, mood changes such as depression, headaches.</p> <p>Risk of hyperkalemia in patients prone to increased K⁺ (e.g., renal disease, concomitant ACEI, ARB, potassium-</p> | <p>May increase cyclosporine levels or hepatotoxicity; may decrease lamotrigine levels. Significant pharmacokinetic interaction with rifampin, griseofulvin (advise backup barrier method during therapy).</p> <p>Monitor INR with concurrent oral anticoagulant use.</p> <p>Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease EE/progestin serum concentrations.</p> <p>Reports of COC failure with concomitant ampicillin, amoxicillin, tetracycline, erythromycin, sulfamethoxazole/trimethoprim or</p> | <p>Failure rate: b <u>2</u></p> <p>Typical use: 9%.</p> <p>Perfect use: 0.3%.</p> <p>Lower-dose COCs are method of choice for most young couples, especially for teens, if combined with condoms; products with lower dose of EE have increased safety, decreased side effects; condoms needed for STI protection.</p> <p>Patients with diarrhea or breakthrough bleeding may be at higher risk of contraceptive failure.</p> <p>Also indicated for acne treatment.</p> | \$\$ |

| Class | Drug | Contraindications | Adverse Effects | Drug Interactions | Comments | Cost ^a |
|---|---|--|---|--|--|-------------------|
| | | | <p>sparing diuretics, NSAID). Check K⁺ after 1st cycle.</p> <p>May increase risk of VTE compared to LNG-containing OCs.</p> | nitrofurantoin. | <p>Packaged with active tablets × 24 days, inert tablets × 4 days.</p> | |
| Contraceptives, oral – combined estrogen (20 µg EE) and progestin, Monophasic | <p>EE 20 µg/drospirenone 3 mg/levomefolate calcium 0.451 mg</p> <p>Yaz Plus</p> | <p>Absolute: history of MI or ischemic heart disease, cerebrovascular disease, complicated valvular heart disease, current or past history of VTE, known thrombogenic mutation, severe cirrhosis, liver tumour, breast cancer, diabetes with microvascular complications, migraines with aura, <6 wk postpartum if breastfeeding, smoker >35 y (≥15 cigarettes/day), hypertension (systolic BP ≥ 160 mm Hg or diastolic BP ≥100 mm Hg), known coagulation-factor deficiency.¹¹</p> <p>Relative: estrogen hypersensitivity, migraine, gallbladder disease, high BMI/weight.</p> <p>Low-dose COCs are relatively contraindicated if BP ≥140/90.</p> | <p>Major: thromboembolism (rare), stroke, retinal artery thrombosis, MI, benign liver tumour, cholelithiasis, hypertension. Watch for danger signals: ACHES—abdominal pain, chest pain, headaches, eye problems, severe leg pain. Advise patient to consult physician.</p> <p>Common: breakthrough bleeding/spotting, amenorrhea, nausea/vomiting, bloating, chloasma, breast tenderness, mood changes such as depression, headaches.</p> <p>Risk of hyperkalemia in patients prone to increased K⁺ (e.g., renal disease, concomitant ACEI, ARB, potassium-sparing diuretics, NSAID). Check K⁺ after 1st cycle.</p> <p>May increase risk of VTE compared to LNG-containing OCs.</p> | <p>May increase cyclosporine levels or hepatotoxicity; may decrease lamotrigine levels. Significant pharmacokinetic interaction with rifampin, griseofulvin (advise backup barrier method during therapy).</p> <p>Monitor INR with concurrent oral anticoagulant use.</p> <p>Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease EE/progestin serum concentrations.</p> <p>Reports of COC failure with concomitant ampicillin, amoxicillin, tetracycline, erythromycin, sulfamethoxazole/trimethoprim or nitrofurantoin.</p> | <p>Failure rate: <u>b</u>, <u>2</u></p> <p>Typical use: 9%.</p> <p>Perfect use: 0.3%.</p> <p>Lower-dose COCs are method of choice for most young couples, especially for teens, if combined with condoms; products with lower dose of EE have increased safety, decreased side effects; condoms needed for STI protection.</p> <p>Patients with diarrhea or breakthrough bleeding may be at higher risk of contraceptive failure.</p> <p>Also indicated for acne treatment.</p> <p>Packaged with active tablets × 24 days, inert tablets × 4 days.</p> <p>First 24 tablets contain all 3 ingredients; last 4 tablets contain levomefolate calcium only.</p> | \$\$ |

| Class | Drug | Contraindications | Adverse Effects | Drug Interactions | Comments | Cost ^a |
|---|--|--|---|---|--|-------------------|
| Contraceptives, oral – combined estrogen (20 µg EE) and progestin, Monophasic | EE 20 µg/levonorgestrel 0.1 mg Alesse , Alysena , Aviane, ESME, Luteru | Absolute: history of MI or ischemic heart disease, cerebrovascular disease, complicated valvular heart disease, current or past history of VTE, known thrombogenic mutation, severe cirrhosis, liver tumour, breast cancer, diabetes with microvascular complications, migraines with aura, <6 wk postpartum if breastfeeding, smoker >35 y (≥15 cigarettes/day), hypertension (systolic BP ≥ 160 mm Hg or diastolic BP ≥100 mm Hg), known coagulation-factor deficiency. ¹¹ Relative: estrogen hypersensitivity, migraine, gallbladder disease, high BMI/weight. Low-dose COCs are relatively contraindicated if BP ≥140/90. | Major: thromboembolism (rare), stroke, retinal artery thrombosis, MI, benign liver tumour, cholelithiasis, hypertension. Watch for danger signals: ACHES— ab dominal pain, ch est pain, h eadaches, e ye problems, s evere leg pain. Advise patient to consult physician. Common: breakthrough bleeding/spotting, amenorrhea, nausea/vomiting, bloating, chloasma, breast tenderness, mood changes such as depression, headaches. | May increase cyclosporine levels or hepatotoxicity; may decrease lamotrigine levels. Significant pharmacokinetic interaction with rifampin, griseofulvin (advise backup barrier method during therapy). Monitor INR with concurrent oral anticoagulant use. Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease EE/progestin serum concentrations. Reports of COC failure with concomitant ampicillin, amoxicillin, tetracycline, erythromycin, sulfamethoxazole/trimethoprim or nitrofurantoin. | Failure rate: b , 2 Typical use: 9%. Perfect use: 0.3%. Lower-dose COCs are method of choice for most young couples, especially for teens, if combined with condoms; products with lower dose of EE have increased safety, decreased side effects; condoms needed for STI protection. Patients with diarrhea or breakthrough bleeding may be at higher risk of contraceptive failure. Also indicated for acne treatment. | \$ |
| Contraceptives, oral – combined estrogen (20 µg EE) and progestin, Monophasic | EE 20 µg/norethindrone acetate 1 mg Minestrin 1/20 | Absolute: history of MI or ischemic heart disease, cerebrovascular disease, complicated valvular heart disease, current or past history of VTE, known thrombogenic mutation, severe cirrhosis, liver tumour, breast cancer, diabetes with microvascular complications, migraines with aura, <6 wk postpartum if breastfeeding, smoker >35 y (≥15 cigarettes/day), hypertension (systolic BP ≥ 160 mm Hg or | Major: thromboembolism (rare), stroke, retinal artery thrombosis, MI, benign liver tumour, cholelithiasis, hypertension. Watch for danger signals: ACHES— ab dominal pain, ch est pain, h eadaches, e ye problems, s evere leg pain. Advise patient to consult physician. Common: breakthrough bleeding/spotting, amenorrhea, nausea/vomiting, bloating, | May increase cyclosporine levels or hepatotoxicity; may decrease lamotrigine levels. Significant pharmacokinetic interaction with rifampin, griseofulvin (advise backup barrier method during therapy). Monitor INR with concurrent oral anticoagulant use. Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. | Failure rate: b , 2 Typical use: 9%. Perfect use: 0.3%. Lower-dose COCs are method of choice for most young couples, especially for teens, if combined with condoms; products with lower dose of EE have increased safety, decreased side effects; | \$\$ |

| Class | Drug | Contraindications | Adverse Effects | Drug Interactions | Comments | Cost ^a |
|---|---|---|--|--|---|-------------------|
| | | <p>diastolic BP \geq100 mm Hg), known coagulation-factor deficiency.¹¹ Relative: estrogen hypersensitivity, migraine, gallbladder disease, high BMI/weight.</p> <p>Low-dose COCs are relatively contraindicated if BP \geq140/90.</p> | <p>chloasma, breast tenderness, mood changes such as depression, headaches.</p> | <p>John's wort, topiramate may decrease EE/progestin serum concentrations.</p> <p>Reports of COC failure with concomitant ampicillin, amoxicillin, tetracycline, erythromycin, sulfamethoxazole/trimethoprim or nitrofurantoin.</p> | <p>condoms needed for STI protection.</p> <p>Patients with diarrhea or breakthrough bleeding may be at higher risk of contraceptive failure.</p> | |
| Contraceptives, oral – combined estrogen and progestin, Triphasic | <p>EE 25 μg/desogestrel 0.1 mg/ 0.125 mg/ 0.15 mg Linessa</p> | <p>Absolute: history of MI or ischemic heart disease, cerebrovascular disease, complicated valvular heart disease, current or past history of VTE, known thrombogenic mutation, severe cirrhosis, liver tumour, breast cancer, diabetes with microvascular complications, migraines with aura, <6 wk postpartum if breastfeeding, smoker >35 y (\geq15 cigarettes/day), hypertension (systolic BP \geq 160 mm Hg or diastolic BP \geq100 mm Hg), known coagulation-factor deficiency.¹¹ Relative: estrogen hypersensitivity, migraine, gallbladder disease, high BMI/weight.</p> <p>Low-dose COCs are relatively contraindicated if BP \geq140/90.</p> | <p>Major: thromboembolism (rare), stroke, retinal artery thrombosis, MI, benign liver tumour, cholelithiasis, hypertension. Watch for danger signals: ACHES—abdominal pain, chest pain, headaches, eye problems, severe leg pain. Advise patient to consult physician.</p> <p>Common: breakthrough bleeding/spotting, amenorrhea, nausea/vomiting, bloating, chloasma, breast tenderness, mood changes such as depression, headaches.</p> | <p>May increase cyclosporine levels or hepatotoxicity; may decrease lamotrigine levels. Significant pharmacokinetic interaction with rifampin, griseofulvin (advise backup barrier method during therapy).</p> <p>Monitor INR with concurrent oral anticoagulant use.</p> <p>Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease EE/progestin serum concentrations.</p> <p>Reports of COC failure with concomitant ampicillin, amoxicillin, tetracycline, erythromycin, sulfamethoxazole/trimethoprim or nitrofurantoin.</p> | <p>Failure rate: b , 2 Typical use: 9%.</p> <p>Perfect use: 0.3%.</p> <p>Lower-dose COCs are method of choice for most young couples, especially for teens, if combined with condoms; products with lower dose of EE have increased safety, decreased side effects; condoms needed for STI protection.</p> <p>Patients with diarrhea or breakthrough bleeding may be at higher risk of contraceptive failure.</p> <p>EE dose stays constant, desogestrel dose increases Q7 days.</p> | \$\$ |
| Contraceptives, oral – combined estrogen and | <p>EE 35 μg/norethindrone 0.5 mg/0.75 mg/ 1 mg Ortho 7/7/7</p> | <p>Absolute: history of MI or ischemic heart disease, cerebrovascular</p> | <p>Major: thromboembolism (rare), stroke, retinal artery</p> | <p>May increase cyclosporine levels or hepatotoxicity;</p> | <p>Failure rate: b , 2 Typical use: 9%.</p> | \$\$ |

| Class | Drug | Contraindications | Adverse Effects | Drug Interactions | Comments | Cost ^a |
|---|--|--|---|---|---|-------------------|
| progestin, Triphasic | | disease, complicated valvular heart disease, current or past history of VTE, known thrombogenic mutation, severe cirrhosis, liver tumour, breast cancer, diabetes with microvascular complications, migraines with aura, <6 wk postpartum if breastfeeding, smoker >35 y (≥15 cigarettes/day), hypertension (systolic BP ≥ 160 mm Hg or diastolic BP ≥100 mm Hg), known coagulation-factor deficiency. ¹¹ Relative: estrogen hypersensitivity, migraine, gallbladder disease, high BMI/weight. Low-dose COCs are relatively contraindicated if BP ≥140/90. | thrombosis, MI, benign liver tumour, cholelithiasis, hypertension. Watch for danger signals: ACHES— abdominal pain, chest pain, headaches, eye problems, severe leg pain. Advise patient to consult physician. Common: breakthrough bleeding/spotting, amenorrhea, nausea/vomiting, bloating, chloasma, breast tenderness, mood changes such as depression, headaches. | may decrease lamotrigine levels. Significant pharmacokinetic interaction with rifampin, griseofulvin (advise backup barrier method during therapy). Monitor INR with concurrent oral anticoagulant use. Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease EE/progestin serum concentrations. Reports of COC failure with concomitant ampicillin, amoxicillin, tetracycline, erythromycin, sulfamethoxazole/trimethoprim or nitrofurantoin. | Perfect use: 0.3%. Lower-dose COCs are method of choice for most young couples, especially for teens, if combined with condoms; products with lower dose of EE have increased safety, decreased side effects; condoms needed for STI protection. Patients with diarrhea or breakthrough bleeding may be at higher risk of contraceptive failure. EE dose stays constant, norethindrone dose increases Q7 days. | |
| Contraceptives, oral – combined estrogen and progestin, Triphasic | EE 35 µg/norethindrone 0.5 mg/ 1 mg/ 0.5 mg Synphasic | Absolute: history of MI or ischemic heart disease, cerebrovascular disease, complicated valvular heart disease, current or past history of VTE, known thrombogenic mutation, severe cirrhosis, liver tumour, breast cancer, diabetes with microvascular complications, migraines with aura, <6 wk postpartum if breastfeeding, smoker >35 y (≥15 cigarettes/day), hypertension (systolic BP ≥ 160 mm Hg or diastolic BP ≥100 mm Hg), known coagulation-factor | Major: thromboembolism (rare), stroke, retinal artery thrombosis, MI, benign liver tumour, cholelithiasis, hypertension. Watch for danger signals: ACHES— abdominal pain, chest pain, headaches, eye problems, severe leg pain. Advise patient to consult physician. Common: breakthrough bleeding/spotting, amenorrhea, nausea/vomiting, bloating, chloasma, breast tenderness, mood changes such as depression, | May increase cyclosporine levels or hepatotoxicity; may decrease lamotrigine levels. Significant pharmacokinetic interaction with rifampin, griseofulvin (advise backup barrier method during therapy). Monitor INR with concurrent oral anticoagulant use. Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease EE/progestin | Failure rate: ^b <u>2</u> Typical use: 9%. Perfect use: 0.3%. Lower-dose COCs are method of choice for most young couples, especially for teens, if combined with condoms; products with lower dose of EE have increased safety, decreased side effects; condoms needed for STI protection. | \$\$ |

| Class | Drug | Contraindications | Adverse Effects | Drug Interactions | Comments | Cost ^a |
|---|---|--|---|---|--|-------------------|
| | | deficiency. ¹¹ Relative: estrogen hypersensitivity, migraine, gallbladder disease, high BMI/weight. Low-dose COCs are relatively contraindicated if BP \geq 140/90. | headaches. | serum concentrations. Reports of COC failure with concomitant ampicillin, amoxicillin, tetracycline, erythromycin, sulfamethoxazole/trimethoprim or nitrofurantoin. | Patients with diarrhea or breakthrough bleeding may be at higher risk of contraceptive failure. EE dose stays constant, norethindrone dose increases between days 8–16 of 21-day cycle. | |
| Contraceptives, oral – combined estrogen and progestin, Triphasic | <i>EE 35 µg/norgestimate 0.18 mg/ 0.215 mg/ 0.25 mg</i> Tri-Cyclen | Absolute: history of MI or ischemic heart disease, cerebrovascular disease, complicated valvular heart disease, current or past history of VTE, known thrombogenic mutation, severe cirrhosis, liver tumour, breast cancer, diabetes with microvascular complications, migraines with aura, <6 wk postpartum if breastfeeding, smoker >35 y (\geq 15 cigarettes/day), hypertension (systolic BP \geq 160 mm Hg or diastolic BP \geq 100 mm Hg), known coagulation-factor deficiency. ¹¹ Relative: estrogen hypersensitivity, migraine, gallbladder disease, high BMI/weight. Low-dose COCs are relatively contraindicated if BP \geq 140/90. | Major: thromboembolism (rare), stroke, retinal artery thrombosis, MI, benign liver tumour, cholelithiasis, hypertension. Watch for danger signals: ACHES— a bdominal pain, c hest pain, h eadaches, e ye problems, s evere leg pain. Advise patient to consult physician. Common: breakthrough bleeding/spotting, amenorrhea, nausea/vomiting, bloating, chloasma, breast tenderness, mood changes such as depression, headaches. | May increase cyclosporine levels or hepatotoxicity; may decrease lamotrigine levels. Significant pharmacokinetic interaction with rifampin, griseofulvin (advise backup barrier method during therapy). Monitor INR with concurrent oral anticoagulant use. Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease EE/progestin serum concentrations. Reports of COC failure with concomitant ampicillin, amoxicillin, tetracycline, erythromycin, sulfamethoxazole/trimethoprim or nitrofurantoin. | Failure rate: ^b <u> </u> , ² <u> </u> Typical use: 9%. Perfect use: 0.3%. Lower-dose COCs are method of choice for most young couples, especially for teens, if combined with condoms; products with lower dose of EE have increased safety, decreased side effects; condoms needed for STI protection. Patients with diarrhea or breakthrough bleeding may be at higher risk of contraceptive failure. EE dose stays constant, norgestimate dose increases Q7 days. Also indicated for acne treatment. | \$\$\$ |

| Class | Drug | Contraindications | Adverse Effects | Drug Interactions | Comments | Cost ^a |
|---|--|--|--|--|--|-------------------|
| Contraceptives, oral – combined estrogen and progestin, Triphasic | <i>EE 25 µg/norgestimate 0.18 mg/ 0.215 mg/ 0.25 mg</i> Tri-Cyclen Lo | Absolute: history of MI or ischemic heart disease, cerebrovascular disease, complicated valvular heart disease, current or past history of VTE, known thrombogenic mutation, severe cirrhosis, liver tumour, breast cancer, diabetes with microvascular complications, migraines with aura, <6 wk postpartum if breastfeeding, smoker >35 y (≥15 cigarettes/day), hypertension (systolic BP ≥ 160 mm Hg or diastolic BP ≥100 mm Hg), known coagulation-factor deficiency. ¹¹ Relative: estrogen hypersensitivity, migraine, gallbladder disease, high BMI/weight. Low-dose COCs are relatively contraindicated if BP ≥140/90. | Major: thromboembolism (rare), stroke, retinal artery thrombosis, MI, benign liver tumour, cholelithiasis, hypertension. Watch for danger signals: ACHES— abdominal pain, chest pain, headaches, eye problems, severe leg pain. Advise patient to consult physician. Common: breakthrough bleeding/spotting, amenorrhea, nausea/vomiting, bloating, chloasma, breast tenderness, mood changes such as depression, headaches. | May increase cyclosporine levels or hepatotoxicity; may decrease lamotrigine levels. Significant pharmacokinetic interaction with rifampin, griseofulvin (advise backup barrier method during therapy). Monitor INR with concurrent oral anticoagulant use. Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease EE/progestin serum concentrations. Reports of COC failure with concomitant ampicillin, amoxicillin, tetracycline, erythromycin, sulfamethoxazole/ trimethoprim or nitrofurantoin. | Failure rate: b , 2 Typical use: 9%. Perfect use: 0.3%. Lower-dose COCs are method of choice for most young couples, especially for teens, if combined with condoms; products with lower dose of EE have increased safety, decreased side effects; condoms needed for STI protection. Patients with diarrhea or breakthrough bleeding may be at higher risk of contraceptive failure. EE dose stays constant, norgestimate dose increases Q7 days. | \$\$ |
| Contraceptives, oral – combined estrogen and progestin, Triphasic | <i>EE 30 µg/ 40 µg/ 30 µg, levonorgestrel 0.05 mg/ 0.075 mg/ 0.125 mg</i> Triquilar | Absolute: history of MI or ischemic heart disease, cerebrovascular disease, complicated valvular heart disease, current or past history of VTE, known thrombogenic mutation, severe cirrhosis, liver tumour, breast cancer, diabetes with microvascular complications, migraines with aura, <6 wk postpartum if breastfeeding, smoker >35 y (≥15 cigarettes/day), hypertension (systolic BP ≥ | Major: thromboembolism (rare), stroke, retinal artery thrombosis, MI, benign liver tumour, cholelithiasis, hypertension. Watch for danger signals: ACHES— abdominal pain, chest pain, headaches, eye problems, severe leg pain. Advise patient to consult physician. Common: breakthrough bleeding/spotting, amenorrhea, nausea/vomiting, | May increase cyclosporine levels or hepatotoxicity; may decrease lamotrigine levels. Significant pharmacokinetic interaction with rifampin, griseofulvin (advise backup barrier method during therapy). Monitor INR with concurrent oral anticoagulant use. Carbamazepine, modafinil, phenytoin, protease inhibitors, | Failure rate: b , 2 Typical use: 9%. Perfect use: 0.3%. Lower-dose COCs are method of choice for most young couples, especially for teens, if combined with condoms; products with lower dose of EE have increased safety, decreased side | \$\$ |

| Class | Drug | Contraindications | Adverse Effects | Drug Interactions | Comments | Cost ^a |
|-----------------------------|---|--|---|--|--|-------------------|
| | | <p>160 mm Hg or diastolic BP \geq100 mm Hg), known coagulation-factor deficiency.¹¹ Relative: estrogen hypersensitivity, migraine, gallbladder disease, high BMI/weight.</p> <p>Low-dose COCs are relatively contraindicated if BP \geq140/90.</p> | <p>bloating, chloasma, breast tenderness, mood changes such as depression, headaches.</p> | <p>phenobarbital, St. John's wort, topiramate may decrease EE/progestin serum concentrations.</p> <p>Reports of COC failure with concomitant ampicillin, amoxicillin, tetracycline, erythromycin, sulfamethoxazole/trimethoprim or nitrofurantoin.</p> | <p>effects; condoms needed for STI protection.</p> <p>Patients with diarrhea or breakthrough bleeding may be at higher risk of contraceptive failure.</p> <p>Both EE and levonorgestrel doses vary at days 7 and 12 of 21-day cycle.</p> | |
| Contraceptives, transdermal | <p><i>EE 600 µg/norelgestromin 6 mg per weekly patch (releases approximately EE 35 µg/day, norelgestromin 200 µg/day)</i></p> <p>Evra</p> | <p>Absolute: history of MI or ischemic heart disease, cerebrovascular disease, complicated valvular heart disease, current or past history of VTE, known thrombogenic mutation, severe cirrhosis, liver tumour, breast cancer, diabetes with microvascular complications, migraines with aura, <6 wk postpartum if breastfeeding, smoker >35 y (\geq15 cigarettes/day), hypertension (systolic BP \geq 160 mm Hg or diastolic BP \geq100 mm Hg), known coagulation-factor deficiency.¹¹ Relative: estrogen hypersensitivity, migraine, gallbladder disease, high BMI/weight.</p> <p>Low-dose COCs are relatively contraindicated if BP \geq140/90.</p> <p>Relative: body weight \geq90 kg (decreased efficacy).</p> | <p>Major: thromboembolism (rare), stroke, retinal artery thrombosis, MI, benign liver tumour, cholelithiasis, hypertension. Watch for danger signals: ACHES—abdominal pain, chest pain, headaches, eye problems, severe leg pain. Advise patient to consult physician.</p> <p>Common: breakthrough bleeding/spotting, amenorrhea, nausea/vomiting, bloating, chloasma, breast tenderness, mood changes such as depression, headaches.</p> <p>Breast discomfort (19%) is more common than with COC in 1st 2 months of use; headache (22%), skin reaction under patch (20%), nausea (20%), dysmenorrhea.</p> <p>2–3% detachment rate from skin.</p> | <p>May increase cyclosporine levels or hepatotoxicity; may decrease lamotrigine levels. Significant pharmacokinetic interaction with rifampin, griseofulvin (advise backup barrier method during therapy).</p> <p>Monitor INR with concurrent oral anticoagulant use.</p> <p>Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease EE/progestin serum concentrations.</p> <p>Reports of COC failure with concomitant ampicillin, amoxicillin, tetracycline, erythromycin, sulfamethoxazole/trimethoprim or nitrofurantoin.</p> | <p>Failure rate: b, 2 Typical use: 9%. Perfect use: 0.3%. Condoms needed for STI protection. Apply once weekly \times 3 wk (on same day each wk), followed by 1 patch-free wk. Apply to dry intact skin of buttock, abdomen, upper outer arm or upper torso.</p> <p>If off for >24 h, apply new patch and use backup method \times 7 days.</p> <p>To switch from COC, apply initial patch on 1st day of withdrawal bleeding. If applied later than 1st day, use backup method \times 7 days. To switch from DMPA, apply 1st patch on day of scheduled</p> | \$\$ |

| Class | Drug | Contraindications | Adverse Effects | Drug Interactions | Comments | Cost ^a |
|------------------------------|---|--|--|---|---|-------------------|
| | | | Studies assessing the risk of VTE in transdermal vs COC users are conflicting. | | injection. | |
| Contraceptives, vaginal ring | <i>EE 15 µg/day, etonorgestrel 120 µg/day</i> NuvaRing | Absolute: history of MI or ischemic heart disease, cerebrovascular disease, complicated valvular heart disease, current or past history of VTE, known thrombogenic mutation, severe cirrhosis, liver tumour, breast cancer, diabetes with microvascular complications, migraines with aura, <6 wk postpartum if breastfeeding, smoker >35 y (≥15 cigarettes/day), hypertension (systolic BP ≥ 160 mm Hg or diastolic BP ≥100 mm Hg), known coagulation-factor deficiency. ¹¹ Relative: estrogen hypersensitivity, migraine, gallbladder disease, high BMI/weight. Low-dose COCs are relatively contraindicated if BP ≥140/90. Relative: uterovaginal prolapse, vaginal stenosis (prevent retention of ring). | Major: thromboembolism (rare), stroke, retinal artery thrombosis, MI, benign liver tumour, cholelithiasis, hypertension. Watch for danger signals: ACHES— a bsdominal pain, c hest pain, h eadaches, e ye problems, s evere leg pain. Advise patient to consult physician. Common: breakthrough bleeding/spotting, amenorrhea, nausea/vomiting, bloating, chloasma, breast tenderness, mood changes such as depression, headaches. Common: vaginal discomfort, vaginitis (5%), headache (6.6%), leukorrhea (5.3%), decreased libido, nausea, breast tenderness. | May increase cyclosporine levels or hepatotoxicity; may decrease lamotrigine levels. Significant pharmacokinetic interaction with rifampin, griseofulvin (advise backup barrier method during therapy). Monitor INR with concurrent oral anticoagulant use. Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease EE/progestin serum concentrations. Reports of COC failure with concomitant ampicillin, amoxicillin, tetracycline, erythromycin, sulfamethoxazole/trimethoprim or nitrofurantoin. May interfere with the correct placement and position of diaphragm or cervical cap—do not use these methods as backup. Concurrent use of vaginal tampons not recommended (ring can be expelled when removing tampon); can use tampons after vaginal ring is | Failure rate: <u>b</u> , <u>2</u> Typical use: 9%. Perfect use: 0.3%. Can be self-inserted and removed; is worn vaginally continuously × 3 wk then removed × 1 wk. Systemic absorption occurs. If ring is left out of the vagina for >3 h use backup method × 7 days. May not provide adequate contraception if left in place longer than 4 wk. Some reports suggest efficacy lasts up to 6 weeks. ⁶ Condoms needed for STI protection. May leave at room temperature for up to 4 months prior to insertion. Can be expelled from vagina while emptying bladder or bowel, especially during severe straining. | \$\$ |

| Class | Drug | Contraindications | Adverse Effects | Drug Interactions | Comments | Cost ^a |
|---|---|--|--|---|---|-------------------|
| | | | | removed. | | |
| Contraceptives, progestin-only, oral | <i>norethindrone</i> Micronor | Absolute: pregnancy, current breast cancer. Relative: active viral hepatitis, liver tumours. | Higher incidence of ectopic pregnancy compared to COC. Irregular bleeding (~12% of users in the first months, <3% in 18 months). | Significant pharmacokinetic interaction with griseofulvin (advise backup barrier method during therapy). Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease progestin serum concentrations. | Failure rate: b , 2 Typical use: 9%. Perfect use: 0.3%. Preferred in lactating women or if contraindication to estrogen; condoms needed for STI protection; packaged as active tablets x 28 days. | \$\$\$ |
| Contraceptives, progestin-only, injectable | <i>medroxyprogesterone acetate</i> Depo-Provera , generics | Absolute: pregnancy, unexplained vaginal or urinary tract bleeding, current diagnosis of breast cancer, known sensitivity to MPA or to the vehicle. Relative: severe cirrhosis, active viral hepatitis, benign hepatic adenoma. | Breast tenderness, insomnia or somnolence, fatigue, mood changes, e.g., depression or irritability, weight gain, menstrual irregularities, decreased libido, skin sensitivity reactions, hyperpyrexia, acne. Long-term: decrease in BMD, delayed return of fertility. | Significant pharmacokinetic interaction with griseofulvin (advise backup barrier method during therapy). Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease progestin serum concentrations. | Failure rate: b , 2 Typical use: 6%. Perfect use: 0.2%. Inject 150 mg within first 5 days of onset of menses (to be effective immediately). Interval between injections must not exceed 13 wk. Excellent for women who should avoid high estrogen doses, e.g., migraine sufferers. Consider other options in women with risk factors for osteoporosis. Condoms needed for STI protection. | \$\$\$/3 months |
| Contraceptives, progestin-only, intrauterine system (IUS) | <i>levonorgestrel</i> 20 µg/day Mirena | Pregnancy, current or recurrent PID, genital infection, postpartum | Spotting for first 3 months after insertion; eventual | Significant pharmacokinetic interaction with griseofulvin | Failure rate: b , 2 0.2%. Condoms | \$350 (lasts 5 y) |

| Class | Drug | Contraindications | Adverse Effects | Drug Interactions | Comments | Cost ^a |
|-------|---|---|--|---|---|-------------------|
| | | endometritis, undiagnosed abnormal uterine bleeding, uterine or cervical malignancy, cervicitis, acute liver disease, hypersensitivity to components of system, hematologic malignancies, uterine anomaly, <4 wk postpartum. | amenorrhea in 20–30% of women. Expelled in 6% of women. | (advise backup barrier method during therapy). Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease progestin serum concentrations. | needed for STI protection. Remains in place for 5 y. Insert within 7 days of onset of menses (to be effective immediately). Although AHA guidelines suggest it is no longer mandatory to use endocarditis prophylaxis for IUD insertion in women with complicated valvular heart disease, use clinical judgment based on the complexity of the heart lesion. May be used postabortion (no difference in safety or expulsion rate compared to copper IUD). ⁸ | |
| | <i>levonorgestrel</i> 14 µg/day Jaydess | Pregnancy, current or recurrent PID, genital infection, postpartum endometritis, undiagnosed abnormal uterine bleeding, uterine or cervical malignancy, cervicitis, acute liver disease, hypersensitivity to components of system, hematologic malignancies, uterine anomaly, <4 wk postpartum. | Prolonged and frequent bleeding and/or spotting for the first 3–6 months of therapy. Over time, infrequent bleeding and amenorrhea may occur. Expelled in 3% of women. | Significant pharmacokinetic interaction with griseofulvin (advise backup barrier method during therapy). Carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease progestin serum concentrations. | Failure rate: ^b 0.4–0.9%. Condoms needed for STI protection. Remains in place for 3 y. Insert within 7 days of onset of menses (to be effective immediately). May be used postabortion. | \$285 (lasts 3 y) |

^a. Approximate cost per 1 package for 1 month unless otherwise indicated; includes drug or contraceptive cost only. Mark-up is not included.

^b. Percentage of women with unintended pregnancy within 1st year of use.

Abbreviations: ACEI=angiotensin-converting enzyme inhibitor; AHA=American Heart Association; ARB=angiotensin receptor blocker; BMD=bone mineral density; BMI=body mass index; BP=blood pressure; COC=combined oral contraceptive; DMPA=depot medroxyprogesterone acetate; EE=ethinyl estradiol; IUD=intrauterine device; IUS=intrauterine system; LNG=levonorgestrel; MI=myocardial

infarction; MPA=medroxyprogesterone acetate; NSAID=nonsteroidal anti-inflammatory drug; PID=pelvic inflammatory disease; STI=sexually transmitted infection; VTE= venous thromboembolism

Legend: \$ < \$10 \$\$ \$10–20 \$\$\$ \$20–30

Table 5: Emergency Contraceptive Methods

| Class | Drug | Contraindications | Adverse Effects | Drug Interactions | Comments | Cost ^a |
|--|--|---|--|--|--|-------------------|
| Contraceptives, IUD: emergency postcoital | <i>copper-T IUD</i> Nova-T, Flexi-T | Absolute: pregnancy, undiagnosed vaginal bleeding, stenosed cervix, copper allergy, current PID or STI, cervical or endometrial cancer, copper allergy, inability to place or retain device. ⁷ Relative: 2–28 days postpartum (to decrease risk of expulsion). ⁸ | Major: salpingitis, uterine perforation, cervical perforation, endometrial embedding, menorrhagia, pain, infection, ectopic pregnancy. | None. | Use within 7 days of unprotected intercourse as an emergency contraceptive. Interferes with implantation after fertilization. Can be used as ongoing method of contraception. | \$70–\$180 |
| Contraceptives, oral progestin: emergency postcoital | <i>levonorgestrel 0.75 mg</i> Plan B , NorLevo , generics | Pregnancy. | Nausea (23.1%), vomiting (5.6%), dizziness, fatigue. | Griseofulvin, carbamazepine, modafinil, phenytoin, protease inhibitors, phenobarbital, St. John's wort, topiramate may decrease levonorgestrel serum concentrations. | Dose: 1.5 mg (2 × 0.75 mg tablets taken together) as soon as possible after unprotected intercourse (most effective if taken within 72 h). 0.75 mg Q12H × 2 doses is equally effective. (Second dose can be taken up to 24 h after 1 st dose without significant change in pharmacokinetics. ⁸³) Heath Canada advisory regarding reduced effectiveness in women weighing 75–80 kg and lack of effectiveness in women weighing ≥80 kg. ⁷⁷ | \$19 |

^a. Cost of 1 dose; includes drug cost only.

Abbreviations: ECP=emergency contraceptive pill; EE=ethinyl estradiol; IUD=intrauterine device

Suggested Readings

[Black A, Francoeur D, Rowe T et al. SOGC clinical practice guidelines: Canadian contraception consensus. *J Obstet Gynaecol Can* 2004;26\(3\):219-96.](#)

[Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention \(CDC\). U.S. Selected Practice Recommendations for Contraceptive Use, 2013: adapted from the World Health Organization selected practice recommendations for contraceptive use, 2nd edition. *MMWR Recomm Rep* 2013;62\(RR-05\):1-60.](#)

[Dunn S, Guilbert E. Emergency contraception. *J Obstet Gynaecol Can* 2012;34\(9\):870-8.](#)

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