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Dr. Dustin Costescu is an obstetrician-gynaecologist and internationally recognized family planning specialist based in Hamilton, Ontario. He completed a fellowship in Contraception Advice, Research and Education from Queen's University, and holds a Master of Healthcare Management from Johns Hopkins University. After ten years in one of the most diverse surgical practices in Ontario, Dr. Costescu is focusing his time, talents, and passion in family planning and sexual health in community practice. Dr. Costescu is now the Medical Director of the Mississauga Women's Clinic, the Toronto Abortion Clinic (formerly the Toronto Morgentaler Clinic) and the Ottawa Abortion Clinic, building on the work he has completed to bring mifepristone to Canada. As a champion of comprehensive sexual and reproductive healthcare, Dustin is currently serving as Co-Chair of the SOGC Sexual Health and Reproductive Equity committee and is a lead author of several clinical practice guidelines in family planning. In 2023, he was appointed by Ontario Health as the Provincial Lead of the Ontario Cervical Screening Program and is playing a key role in the transition to HPV-based cervical screening.



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IDENTIFYING THE OPTIMAL BIRTH CONTROL FOR PATIENTS

Introduction

Despite decreases in pregnancy and abortion rates over the past few decades, unintended pregnancy remains a personal and public health challenge.¹ In the 1960s, the first birth control pills (progestin only and combined) revolutionized contraceptive effectiveness despite their high estrogen doses. In the 1980s, safety became front of mind, as older intra-uterine devices (IUDs) and implants were removed from the market, leading to the development of newer, safer options we enjoy today. In the 1990s, pill-related venous thromboembolism (VTE) scares led to surges in unintended pregnancy rates in the United Kingdom and Europe, only to be repeated in the 2000s. In the 2010s, long-acting reversible contraception (LARC) was hailed as the path forward for reducing pregnancy rates and, indeed, this has contributed to modest reductions in unintended pregnancy and abortion rates.

This decade has seen two major shifts in contraceptive care: the transition to blended models of service delivery (especially virtual and subscription-based options) and a transition toward “needs-based” counselling.

A Needs-based Approach to Contraception Counselling

The goal of needs-based counselling is to center the patient in the contraceptive discussion.² Patients want information about risks, benefits, and side effects, however, they wish to make the final decision. The jumping off point in needs-based contraception counselling is to invite the patient to suggest a method. While intuitive, this is a surprisingly significant departure from most approaches (e.g., pill-first or effectiveness-first).

Contraceptive choices are often based on social networks (what friends and family members are using). As first-generation LARC users become parents to sexually-active youth, there is a much greater degree of comfort with LARCs in teens and young adults than in previous generations. In addition to social networks, social media provides patients access to innumerable educational videos and reviews of birth control experiences, both positive and negative. While imperfect, the quality of birth control information being shared online is a significant improvement over schoolyard whispers and parent conversations. As a result, they tend to come to clinic more informed and motivated.

The Tic-Tac-Toe Approach

Needs-based counselling need not be difficult. Most patients seeking birth control have some sense of what they want to use, and want to know if it is a “good” option for them. Others may not know what to use, but the list of options can be rapidly narrowed with a few questions. The tic-tac-toe method has served me well over thousands of consultations. The first three questions are as follows:

1. What would you like to try?
2. What other benefits do you hope to receive from your birth control? (Indications)
3. Screen for method contraindications

If appropriate, prescribe an appropriate therapy. If the patient is unsure about the method, ask the next three questions:

4. What is your timeline to a future pregnancy (if ever)?
5. Which of these methods is acceptable?
6. Check cost/coverage issues.

Start by understanding the patient’s timeline to pregnancy in order to initiate the conversation around a short-acting or long-acting method. Thereafter, review methods focusing on administration, effectiveness and side effects. Last, confirm coverage/affordability and make use of patient support resources that lower costs.

With so many methods, routes of administration and side effect profiles, it can be overwhelming for patients (and providers) to select a method. **Figure 1** shows a typical starting point for a patient who needs a full contraception consult. **Figure 2** summarizes the approach to short-acting methods. This paper will discuss troubleshooting methods as we work to find the optimal birth control for each patient.

Approach to Long-acting Methods

There are now four LARC methods available on the Canadian market, each with similar characteristics of high effectiveness, easy adherence, and high patient confidence. As all LARC methods have failure rates of less than 1%, the key to LARC counselling is to focus on the differences between each method, and less so its similarities.³

Copper IUDs

A copper IUD is more likely to be a second- or last-line option, but is an excellent option for many. A LARC user who wants the reassurance of a menses, has relatively light cycles prior to placement, and/or who wants a truly hormone-free option will be happiest with this device. There are nearly 20 options available. Keep in mind that three-year devices may have higher failure

rates if used for longer. Five-year and 10-year devices can easily be extended, especially in patients who are over age 35 at the time of insertion.

Hormonal IUDs⁴

As the 52 mg hormonal IUD has therapeutic indications, the Society of Obstetricians and Gynaecologists of Canada (SOGC) recommends it as the first-line LARC where bleeding control is required. Due to the relative ease of placement of a smaller-framed 19.5 mg device, this is the preferred option in younger and nulliparous patients (and those anxious about their first IUD placement). In patients who are both young/nulliparous with heavy menses, clinical experience suggests that a 52 mg device will provide the best outcome. However, in some cases I initiate with a 19.5 mg device if the patient is very concerned about pain with placement. Side effect profiles are similar in Phase III studies, therefore switching to a lower-dose IUD is unlikely to improve levonorgestrel side effects.

Implants

With nearly four years on the Canadian market, clinicians are still trying to determine the optimal place for implants in their counselling algorithms. The most obvious is for patients who wish to avoid (or had a negative experience with) an IUD. The simplicity of placement and removal make implants a favourable option for clinicians who are not comfortable with pelvic exams. The most frequent question I am asked at medical presentations is “What else can implants be used for?”. The short answer is that they are intended for contraception only, however they may be a good option for patients with dysmenorrhea, transgender patients on testosterone, and in patients willing to try an implant for bleeding improvement prior to using a hormonal IUD.

Short-acting Methods: Sorting Through the Options

Most patients will use a short-acting birth control method as their contraceptive of choice at least once in their lifetime, and most new contraceptive users will initiate a combined oral contraceptive pill (COC). For this reason, clinicians reflexively initiate birth control with pills before transitioning to other options, and patients may not be aware of alternatives to these. Reviewing preference for LARC methods, estrogen-free options and non-oral options first, will quickly inform the patient of alternatives, and ensure that a pill is the best fit for them. A review of specific patient groups appears below.

Youth. When selecting a pill for a teenager, a higher estrogen-containing pill is recommended by the Canadian Paediatrics Society. Almost immediately, clinicians and parents face cognitive dissonance about hormone exposure in youth. The main reason to initiate a teen on a 30 mcg ethinyl estradiol. ([EE] or E4)-containing COC is for bone density preservation. Peak bone mineral

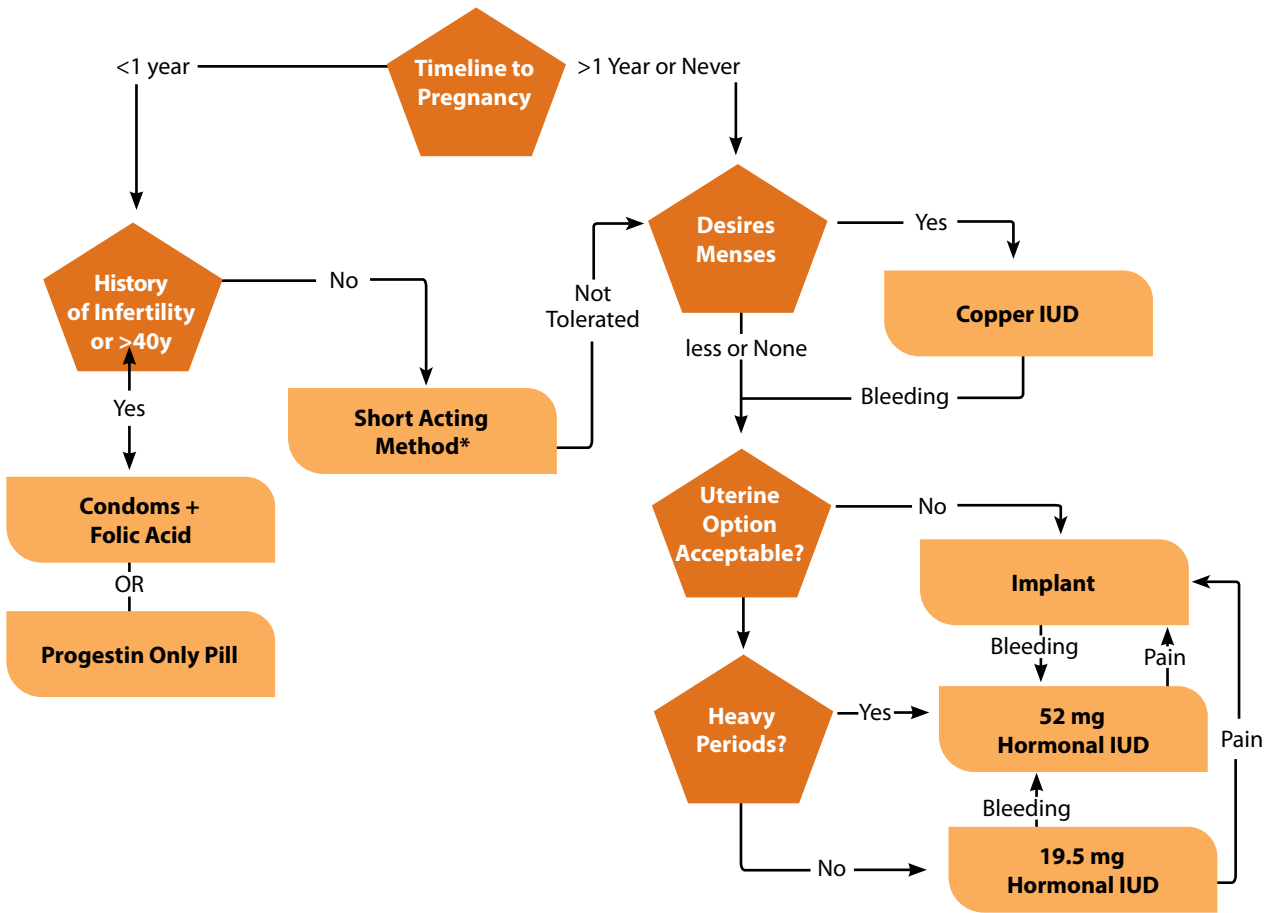


Figure 1. Simplified counselling algorithm and long-acting reversible contraceptive counselling; *courtesy of Dustin Costescu, MD, MS, FRCSC.*

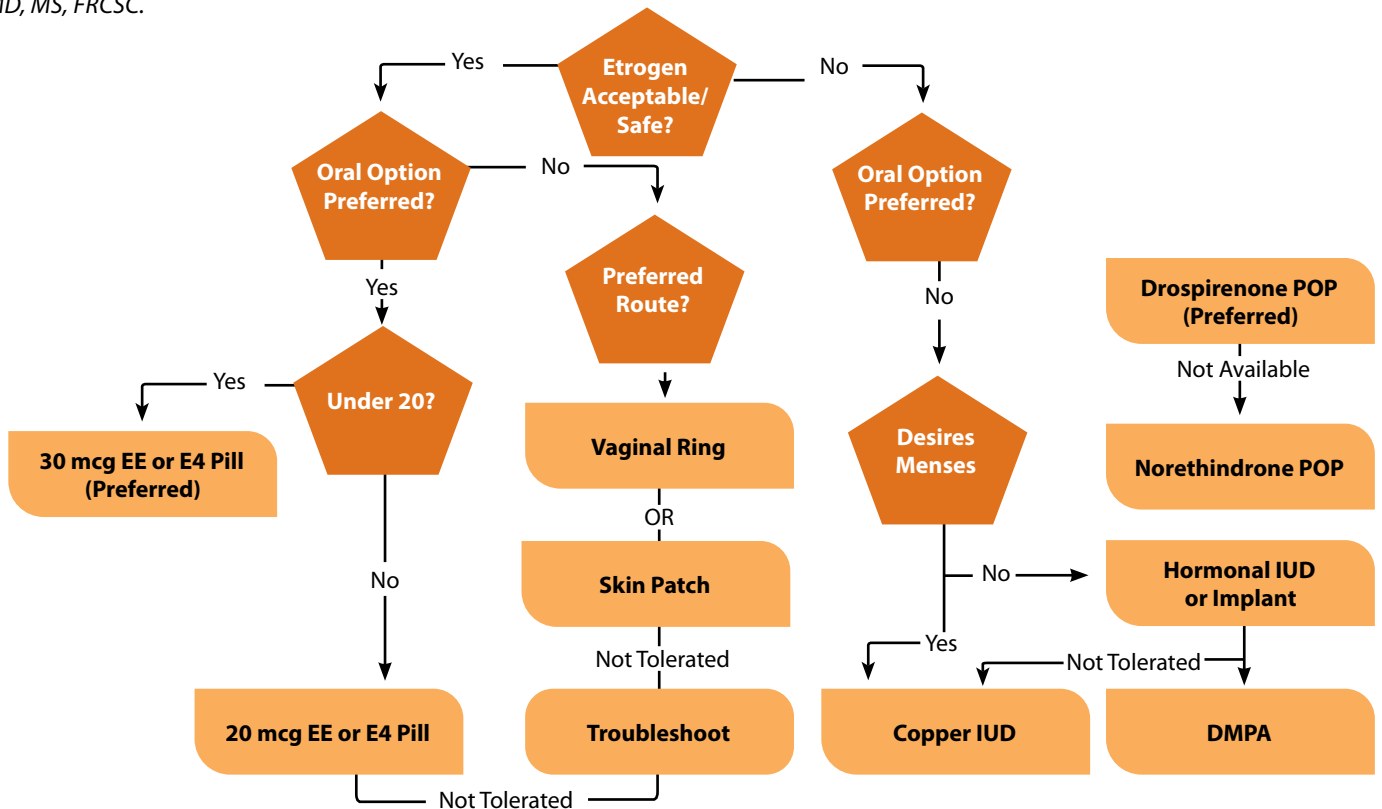


Figure 2. An approach to initiating short-acting contraception; *courtesy of Dustin Costescu, MD, MS, FRCSC.*

density (BMD) is around age 21 and comparative studies show that there is impairment in peak BMD in low dose users (under 30 mcg). LARCs do not have adverse impact on bone health, nor do progestin only pills (POPs). If a mid-range pill is not tolerated due to estrogen side effects, a lower dose can be selected next.

Older users. Patients over the age of 35 may acquire additional health conditions for which estrogen is contraindicated.⁶ In light of this, special consideration should be taken when prescribing any combined hormonal contraceptive in this population. The decision to use an estrogen-containing option vs an estrogen-free option is far more important than the dose of estrogen, if used. When uncertain about estrogen contraindications, the SOGC follows the CDC-US Medical Eligibility Criteria for Contraceptive Use (US-MEC).⁷ There is an app available that outlines a large number of medical conditions and assigns a four-point score based on risk. If the condition ranks as 1 or 2, prescribe without consultation. If a 3 or 4, do not prescribe and consider expert consultation.

Amenorrhea. While LARCs are well known for inducing amenorrhea (Depot medroxyprogesterone acetate [DMPA] over 60%, 52 mg IUD 40%, 19.5 mg IUD 24%, and implant 24%), certain short-acting methods are more likely than others to cause amenorrhea as well. While amenorrhea is often desired or accepted, it is critical to forewarn patients that this is normal. Specifically, there is no association with amenorrhea on oral contraceptive pills and premature ovarian insufficiency.

As a general rule, pills with a shorter hormone interval (24/4 and 24/2/2), and lower-dose COCs are associated with a higher rate of amenorrhea than standard 21/7 pills. The pill associated with the highest rate of amenorrhea is the 10 mcg EE/norethindrone acetate (NETA) pill (35%), followed by E4/drospirenone (DRSP) (11%), then other 24/4 formulations. While amenorrhea is common with NETA POP, it is uncommon with DRSP POPs. Patients with amenorrhea should undertake a pregnancy test and, if negative, can be reassured that this is normal.

Approximately 60% of pill users will skip hormone-free intervals to avoid menstruation during times of travel, holy pilgrimages, anticipated sexual activity, or simply to enjoy amenorrhea. This is safe and does not increase the risk of VTE. Patients using pills on a continuous basis will eventually develop spotting from an atrophic lining. If this occurs, stop the pill for 4 days and resume.⁶

Unscheduled bleeding. A major advantage of estrogen-containing contraceptives is stabilization of the endometrium and an overall reduction in bleeding. However, many patients will experience unscheduled bleeding (bleeding which occurs outside of expected menses). As a general rule, progestin- only pills and lower-dose (20 mcg EE and less) pills are associated with

a greater rate of unscheduled bleeding. E4/DRSP has a relatively low rate of unscheduled bleeding, and may reflect differences in endometrial receptivity vs ethinyl estradiol. Patients experiencing unscheduled bleeding should switch to an E4 or 30 mcg+ EE pill. Exercise caution when switching pills as many are similar to each other, and occasionally a patient will simply switch brands of the same pill, without improvement. Continued unscheduled bleeding may warrant a discussion about alternatives, especially if adherence is the problem.

Acne. Estrogen-containing pills reduce acne by two main mechanisms: estrogen reduces sebum production and LH blockade by progestins reduce androgen levels. Drospirenone and cyproterone-containing pills also have direct antiandrogenic effects at the receptor-level. A common marketing tool in the 1990s, debate exists as to whether or not the “androgenicity” of the progestin in a pill contributes to acne and side effects. In acne studies, however, pills containing cyproterone and drospirenone are less comedogenic, followed by desogestrel (and its first level metabolite etonogestrel), and finally norethindrone, norgestimate and levonorgestrel (LNG).⁶

Mood. Hormone-related mood effects are poorly understood and under-reported. Taking a careful history, including whether or not mood is worse during the hormone-free interval or when taking pills, and the type of mood concern, are essential. Estrogens tend to cause activating symptoms, whereas progestins and hormone withdrawal mood disorders tend to aggravate depressive symptoms. The EE20/DRSP pill is approved in the United States for the treatment of premenstrual dysphoric disorder. Apart from that, unfortunately, finding a good mood pill is a trial and error endeavour. For patients with cyclical mood issues, a hormonal IUD may not help, as most patients ovulate with a hormonal IUD.⁴

Headache. Patients with pre-existing headache should be evaluated for the presence of migraine with aura (particularly non-visual aura). Many patients who report migraines do not have true migraine headache and do not have focal neurological deficit. Patients with non-aura migraines can use estrogen-containing contraceptives, although caution should be considered in those over age 35.

Pill-associated headaches occur either from estrogen dosing or estrogen withdrawal. Patients with migraines in the hormone-free window (so called menstrual migraines) can continue their method and possibly reduce or eliminate the hormone-free interval semi-continuously or altogether. Patients experience headache on COCs almost always due to estrogen content. Therefore, reducing the estrogen content or switching to a progestin-only method should be considered if patients experience headaches when taking active medication.⁶

Estrogenicity Theory and Venous Thromboembolism

No contraception review is complete without a discussion of VTE, the most serious complication from estrogen-containing contraceptives. The attributable risk of death from provoked chronic traumatic encephalopathy is approximately 3 per million pill users, with most occurring in those with an inherited or acquired thrombophilia. This risk must be interpreted in the context of VTE from pregnancy or puerperium, which is 10–100 times higher. Therefore, prevention of pregnancy also greatly reduces a patient's chances of developing a VTE.⁶

The Estrogenicity Theory is born of the observation that progestins alone are not thrombogenic, but may differ in their ability to mitigate some of the VTE risk of the estrogen component of the pill. Initially, the rationale was that "Estrogenicity = Estrogen Dose – Androgenicity of Progestin". With the advent of better hematological testing, in particular activated protein C resistance assays, it appears that anti-thrombotic activity is independent of androgenicity.⁸

Therefore, in order to alter the VTE-causing potential of a combined hormonal contraceptive (CHC), we can change either the estrogen dose, the estrogen type, or progestin.

It is well-known that there is a dose-dependent relationship between estrogen and VTE. Estrogens promote both clotting factor production and Protein C and S resistance (reducing the antithrombotic effects of these proteins). In population-based studies, pills with 50 mcg EE or higher are associated with an increase in VTE compared to those with lower doses. Below 50 mcg, it is not clear that further reductions lower VTE risk.⁹

Ethinyl estradiol is a highly bioavailable and metabolically active estrogen, with high liver activation and high thrombogenicity. It also has high persistence via enterohepatic circulation, so even transdermal preparations of EE are associated with high rates of VTE and are no safer than oral options. A new COC option containing estetrol is much less thrombogenic (based on Phase III and in vitro data). Therefore, if a CHC is desired, E4/DRSP should be considered, followed by a 20 mcg pill containing LNG or NETA.

Among pills, patches and rings containing EE, there are slight differences (<3 per 10,000) in VTE risk between different progestins. Older pills containing LNG or NETA are less thrombogenic than those containing desogestrel (DSG) or DRSP. If a patient is sufficiently concerned about VTE risk to choose a pill brand that is less thrombogenic, they should be informed about progestin-only options as an alternative.¹⁰

DMPA is associated with a two-fold increase in VTE compared to the incidence of VTE among non-users. However, DMPA is often (and can be) used in patients with VTE risk factors, especially given limited alternatives.

Next and Last Line Options

Satisfaction and Switching. Patient satisfaction with birth control, like many preventative medications, is difficult to measure. Success from the provider perspective is prevention of unplanned pregnancy, but patients often don't recognize the value of prevention. Patients measure satisfaction based on adherence, tolerability and "switching intention" – the degree to which they wish to try a different method. Adherence refers to the ability to use a method consistently and correctly as often as possible – using a condom each time, taking a pill each day, changing a ring each month, getting an injection every season, and so on. However, adherence is more than remembering – adherence is affected by convenience, access, confidence that the method will work, and acceptability of side effects attributable to the method. Patients may be more interested in switching methods than you think. Switching intention is highest (about 50%) among users of less effective options, such as condoms, especially if there has been a condom failure or adherence is a challenge. Users of short-acting methods also report high switching intention, either because of contraceptive failure, lack of confidence in the method (or adherence to dosing), a long timeline to pregnancy, or side effects. LARC users report the lowest switching intention, reflecting both high satisfaction but also limited alternatives. At the conclusion of any contraception consult, raise the option of discussing alternatives at a follow-up visit if there is room for improved side effects or there is interest in switching methods.¹¹

Last line options. Conspicuously absent from the treatment algorithms are two important options: Injectable DMPA and permanent contraception. DMPA is an important contraceptive because, in many cases, it is the treatment of last resort for patients who have not tolerated other options, those with repeated contraceptive failures, and those requiring therapeutic amenorrhea. The delay to fertility return and weight gain are the main reasons why it is not offered early in the algorithm, but this option is safe, minimally thrombogenic, and should be considered when other options have not been acceptable.

Permanent contraception remains a human right. In Canada, more couples rely on vasectomy than salpingectomy, however it is an outlier when compared to global statistics. Permanent contraception should be offered to patients who are certain they desire no (or no further) children. It should not be offered because a

patient cannot access reliable reversible contraception, or because of a lack of tolerance of reversible methods. Surgical backlogs have made tubal ligation surgeries less accessible with significantly longer wait times and the risk of unintended pregnancy while waiting. Ensure that patients have alternative methods while on the surgical waiting list.

Conclusion

Unintended pregnancy is a fact of life, but there is a method of contraception available for each patient. The best method of birth control is the one the patient wants to use, is able to use, is well-tolerated, and that the patient trusts. Good counselling and clever troubleshooting are the keys to finding the appropriate method when a first-line option does not fit. Focusing on patient needs leads to higher satisfaction and better outcomes.

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References

1. Black A, Guilbert E, Costescu D et al. Canadian Contraception Consensus. *J Obstet Gynecol Can.* 2015 Oct 37(10):936-42.
2. Bitzer J, Oppelt PG, Deten A. Evaluation of a patient-centred, needs-based approach to support shared decision-making in contraceptive counseling: the COCO Study. *Eur J Contracept Reprod Health Care.* 2021 Aug;26(4):326-33.
3. Black A, Guilbert E, Costescu D et al. Canadian Contraception Consensus (Part 3 of 4): Chapter 8 - Progestin-Only Contraception. *J Obstet Gynecol Can.* 2016 Mar;38(3):279-300.
4. Costescu DJ. Levonorgestrel-releasing intrauterine systems for long-acting contraception: current perspectives, safety, and patient counseling. *Int J Womens Health.* 2016 Oct 13:8:589-598.
5. Di Meglio G, Crowther C, Simms J, Canadian Paediatric Society Adolescent Health Committee. Contraceptive care for Canadian youth. *Paediatr Child Health.* 2018;23(4):271-277.
6. Black A, Guilbert E, Costescu D, et al. Canadian Contraception Consensus Part 4 of 4 Chapter 9: Combined Hormonal Contraception. *J Obstet Gynaecol Can.* 2017 Apr;39(4):229-268.e5.
7. Centres for Disease Control. US Medical Eligibility Criteria for Contraceptive Use, 2016 (US MEC) <https://www.cdc.gov/reproductivehealth/contraception/mmwr/mec/summary.html> Accessed February 4, 2024.
8. Morimont L, Haguët H, Dogne JM et al. Combined oral contraceptives and venous thromboembolism: review and perspective to mitigate the risk front. *Endocrinol.* 2012;12 769187.
9. Lidegaard Ø, Milsom I, Geirsson RT, Skjeldestad FE. Hormonal contraception and venous thromboembolism. *Acta Obstet Gynecol Scand.* 2012; 91:769-778.
10. Lidegaard O, Nielsen LH, Skovlund CW et al. Venous thrombosis in users of non-oral hormonal contraception: follow-up study, Denmark 2001-10. *BMJ.* 2012;344:e2990.
11. Steinberg JR, Marthey D, Xie L et al. Contraceptive method type and satisfaction, confidence in use, and switching intentions. *Contraception.* 2021 Aug; 104(2): 176-182.