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Choices for Effective Contraception in 2006

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One of the remarkable advances for women in the last 50 years has been the development, scientific testing and availability of effective hormonal contraception methods such as oral contraceptives (the Pill). Given CeMCOR's goal to see each woman attain healthy ovulation and regular menstrual cycles as well as to control her own fertility, we believe that hormonal contraception, especially the Pill, should only be used for birth control. In weighing choices, contraception methods should pose no greater risks than those associated with (unwanted) pregnancy.

Hormonal contraceptives have become safer in recent years as their estrogen doses have decreased, as new progestins not from male hormones have been developed, and with the recent availability of hormonal contraception in the form of a vaginal ring or a skin patch. These last non-Pill kinds of contraceptives have had little press, but probably much safer. That is because their high estrogen levels are delivered, not through the mouth to the liver and then into the blood stream, but through the skin or vagina and directly into the blood stream. That is important because pill forms of estrogen cause the liver to make higher levels of blood clotting factors—the higher the clotting factors the greater the risk for blood clots (thrombophlebitis and pulmonary embolism) ([1](#) [1]).

Pill forms of estrogen (whether in Pill or in menopausal ovarian hormone therapy) cause increased risks for blood becoming thicker and making a blockage or clots in the blood stream ([1](#) [2]). These blood clots can go to the lungs (pulmonary embolism) and cause a life threatening problem and also to avoidable risks for diseases like strokes and heart attacks. Just like I will no longer recommend pill forms of estrogen, even bio-identical estrogen, for women who need it for menopause, I strongly suggest that the vaginal ring or patch form of hormonal contraception be used, if at all possible, instead of the Pill.

My primary contraceptive recommendation, however, is not hormone-changing methods. It is a combination of a physical barrier to sperm plus a local vaginal spermicide. Barrier methods include diaphragms, condoms, female condoms and cervical caps. Local vaginal contraceptives are available as jelly or foam. This barrier-plus-vaginal-spermicide method, if used every time, is as effective as hormonal contraception and poses no health risks. Furthermore, given that barrier methods decrease the risks for sexually transmitted infections (such as HIV, hepatitis, gonorrhea, syphilis and others), this non-hormonal method makes even more sense. Of barrier choices, my own preference is for the diaphragm because a woman controls its use and can put it in place ahead of time. Most local Planned Parenthood clinics or Community Health Centres can provide birth control information and fit diaphragms.

How does the Pill work?

Hormonal contraception, to be successful, must disrupt the normal reproductive system at one or more of its important parts: hypothalamus and pituitary (in the brain), ovary, uterus and cervix. Current pills rely on high dose estrogen to suppress the brain's stimulation of the ovary and on a progestin to make the endometrial lining of the uterus thin and dry out the cervical mucus. Although we call the hormones in the current Pills “low dose,” that's compared with the first super-high dose pills from the 1960s. To be effective at preventing pregnancy, the doses of estrogen and progestin in the Pill have to be high enough to (usually) suppress the brain, pituitary and ovary production of hormones. Compared to

average estrogen and progesterone levels during the normal menstrual cycle, current Pills, the patch and the vaginal ring cause about four times higher estrogen effects and about the same synthetic progestin effects as ovulatory menstrual cycle progesterone.

The Pill, compared with the patch or vaginal contraceptives, appears to give a different pattern of estrogen levels. In general, the Pill, taken once a day, gives a high level of estrogen for part of the day, but average levels are lower. In contrast, the patch and vaginal ring contraceptives don't produce a high peak estrogen level but may produce higher average estrogen levels. Recently the contraceptive patch in the USA was served with an FDA warning because it released an average amount of estrogen that was higher than current Pill levels. However, the Canadian form of the same patch has an importantly lower dose of estrogen (0.6 versus 0.75 µg ethinyl estradiol). With this lower dose patch, average ethinyl estradiol levels are similar to the Pill (2 [3]).

For reasons of tradition, and because the previous Pill progestins were all derived from male hormones and had negative effects on cholesterol, the amount of progestin in the modern Pill is controlled to be relatively less high than estrogen. Progestins, like estrogen, produce contraception through suppressing the brain control of reproduction, but they also make the uterine lining too thin for a fertilized egg to hold on and grow, and make the cervix dry. Estrogen, especially in high levels like at the midcycle peak in the normal menstrual cycle, causes the cervix glands to make slippery clear mucus that helps sperm swim upward to fertilize an egg. Progesterone and progestins inhibit the actions of estrogen on cervical mucus. Therefore, there are successful forms of contraception that contain only a progestin, including a daily low-dose (0.35 mg) norethindrone pill (so called “mini-Pill”), the safest of two morning-after emergency contraception methods (called “Plan B”), a progestin-only injection with medroxyprogesterone and a levonorgestrel-releasing IUD. There is no estrogen-only hormonal form of contraception because it would cause endometrial cancer.

The Pill suppresses the brain control of reproduction, therefore we think of it as preventing our own ovaries from making hormones. However, a few small follicles (that each hold an egg and make estrogen) develop continuously within our ovaries, starting before our first period and continuing without regard to hormone levels until menopause (3 [4]). Usually the Pill prevents ovulation (release of an egg by the ovary), however, recent research shows that on the Pill (4 [5]) and patch (5 [6]) follicles do continue to develop and do also make some estrogen. Most follicle growth and estrogen production appears to occur during the week off hormones in the typical 28-day cycle contraception method. Importantly, estrogen amounts made by women's own bodies while taking the Pill are greater in overweight women with a body mass index (BMI, weight divided by height squared) greater than or equal to 25 compared with those under 25 (normal weight) (4 [7]).

Are there serious risks from use of the Pill?

Although we think of the Pill as safe, a 25-year study in over 45,000 British women, of whom half were on the Pill and half weren't, showed that deaths from cancer of the cervix (mouth of the uterus) and from cardiovascular diseases (like blood clots, strokes and heart attacks) were significantly increased in women on the Pill (6 [8]). That study started when Pill hormones were about 5 times higher than they are today—at its end, Pill hormones were similar to current doses. The overall death rate was similar between those on and not on the Pill, although causing cervical cancer and heart/stroke deaths, because it prevented deaths from ovarian cancer (6 [9]). A recent careful combination of all studies since 1980 of cardiovascular and blood vessel diseases during current normal-cycle Pill use showed that even the lowest dose Pills cause a doubling of the (low at that age) risk for strokes and heart attack (Baillargeon 2005). A case-control study of young women ages 18-49 with a heart attack (called cases) compared with matched women from the general population (called controls) has shown that even the lowest estrogen dose Pills still increase the risk for strokes. Heart attacks tend to be less in users of Pills with progestins not derived from male hormones (7 [10]).

To put the health risks from Pill use into practical guidelines, these are some recommendations. Those considering use of the Pill should absolutely not take it if you have a family or personal history of abnormal blood clotting or thrombophlebitis, are actively ill with hepatitis or mononucleosis (viral disease of the liver that estrogen treatment could worsen), have had breast or endometrial cancer, or are allergic to the hormones in the Pill. Pill use carries increased risks if you have a family history of breast cancer, are overweight (BMI over 25), currently smoke, have migraine headaches or have anovulatory androgen excess (sometimes called PCOS — see “[Help for Anovulatory Androgen Excess \(AAE\) — Challenge PCOS!](#) [11]”). All women should have a normal pelvic examination and Pap test before starting the Pill.

What about teenagers' use of hormonal contraception?

The ovulatory menstrual cycle takes many years to become established (8 [12]) even though regular periods commonly develop within a year or so of the first period (9 [13]). Because all forms of hormonal contraception are designed to disturb

the brain control of ovulation, and this system needs to grow up in teenagers, we have concerns about anything disrupting that delicate and important process. Also current “low-dose” Pills are very likely to fail as contraception if one or more Pills are missed. Injection forms of medroxyprogesterone are also not recommended (see “[Depo Provera and Osteoporosis](#) [14]”). In addition, recent information is confirming an earlier study showing that young women using the Pill don't gain bone normally ([10](#) [15]).

Sexually active teenagers, however, need effective contraception. The health risks for pregnant teenagers, for teenaged mothers and for their babies are higher than average. Also, the potential for life-disruption from an unwanted pregnancy is great for teenaged women who are still developing the skills they need for independent adulthood. For all of these reasons the preferred contraception is the barrier-plus-vaginal-spermicide method described earlier. That should be possible, effective and safe for conscientious teenagers especially with easily available, over-the-counter emergency contraception ([11](#) [16]) as backup.

What about use of the Pill in perimenopause?

If the usual Pill doesn't entirely suppress ovarian hormone production, and estrogen production is even higher in overweight women, theoretically using the Pill in perimenopause would carry both greater risks for contraceptive failure and very high estrogen levels. There are potentially important differences between taking the Pill as a young woman and taking it as a perimenopausal woman. We know that estrogen levels rise in perimenopausal women because the normal brain-ovary feedback loops are disrupted with ovarian aging ([12](#) [17]) (see “[Perimenopause: The Ovary's Frustrating Grand Finale](#) [18]”). We also know that weight tends to increase in perimenopause. We believe that both this abnormal perimenopausal feedback and the weight gain of perimenopause are reasons to avoid use Pill use for contraception during this time. The risks for clots, strokes and heart attacks also increase with age in women and these risks are probably doubled by current use of cigarettes. Therefore, any current smoker should avoid the use of the Pill.

Sometimes the Pill is recommended in perimenopause for contraception, control of bone loss and treatment of hot flashes. To our knowledge there is only one randomized double blind controlled trial of the Pill for treatment of heavy bleeding and it showed the Pill didn't decrease flow until it had been taken for four months ([13](#) [19]). This Pill also didn't significantly control hot flashes or improve quality of life compared a placebo ([13](#) [20]). However, the Pill may help prevent bone loss in perimenopausal women in Phases C, D, and E (see “[Could I be in Perimenopause?](#) [21]”) who are having irregular or skipped periods ([14](#) [22]) based on not very scientific (not randomized or placebo-controlled) evidence.

What about the Pill and safety for bones and osteoporosis?

We know that estrogen or estrogen with progestin therapy in menopausal women increases bone mineral density (a good thing) and prevents fractures ([15](#) [23]). We have thought that the Pill would also prevent osteoporosis. And there are some studies, usually small, in older women and without good controls suggesting that is true. However, a random sample of about 550 premenopausal Canadian women ages 25-45 showed that those who had ever used the Pill had lower bone density levels than did women who had never used the Pill ([16](#) [24]). An earlier study showed that young women using the Pill didn't gain bone density normally compared with women not on the Pill ([10](#) [25]). Recently a controlled study showed that negative effect of the Pill for young women's bones could be prevented by eating more calcium-rich foods ([17](#) [26]). There is a need for more controlled studies of bone density changes, especially in young women, on the Pill.

What about continuous use of the Pill, patch or vaginal ring to stop menstruation?

There is increasing interest in elimination of periods with continuous or long cycle (say 84 days of Pills and 7 days without) rather than the classical 21-out-of-28-day use of the Pill ([18](#) [27]), contraceptive patch or vaginal ring. I believe the following, as quoted in a MacLean's Magazine article on December 12th, 2005: “Menstruation, this amazingly intricate, carefully crafted cycle, is a vital sign of our health. To wantonly disrupt it is a horrifying thought.” We are currently preparing a full article about long-cycle and continuous contraception.

In summary, effective hormonal contraception, especially the Pill, provided a marvelous advance for women in the last several decades. Recently both patch and vaginal ring contraceptives have become available—these decrease the risks for blood clots (and other vascular diseases) that are related to the Pill. There are still many concerns such as use of the Pill in teenagers, perimenopausal women, overweight women and those who smoke. I believe it is a better choice, given the availability of effective, safe options (such as barrier-plus-vaginal-spermicide contraception) to use these rather than hormonal contraception. Hormonal contraception requires high doses of synthetic hormones and disrupts our own important menstrual cycle and ovulation.

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