

Contraception

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HIGH-RISK PATIENT POPULATIONS

The highest-risk patients are those with pulmonary hypertension and those with prior peripartum cardiomyopathy. The American College of Cardiology recommendations for women with adult congenital heart disease are as follows:

1. Women of childbearing potential with congenital heart disease should be counseled about the risks associated with pregnancy and appropriate contraceptive options.
2. Estrogen-containing contraceptives are potentially harmful for women with congenital heart disease at high risk of thromboembolic events (e.g., cyanosis, Fontan physiology, mechanical valves, prior thrombotic events, pulmonary arterial hypertension).

BIRTH CONTROL METHODS

Birth control methods include behavioral methods, barrier contraceptives, hormonal contraceptives, intrauterine devices (IUDs), and sterilization; all of these are used before or during sex. So-called emergency contraceptives, which are used after sex, are effective for up to a few days afterward. Each is discussed in this chapter.

All birth control methods have risks and complications, including a risk of failure resulting in an unwanted pregnancy. The effectiveness of contraceptives is generally expressed as the percentage of women who become pregnant using a given method during the first year. However, among highly effective methods, such as tubal ligations, the effectiveness is expressed as a lifetime failure rate. Surgical sterilization, implantable hormones, and IUDs all have first-year failure rates of less than 1%. Hormonal contraceptive pills, patches, or vaginal rings, if used strictly, also can have first-year failure rates of less than 1%. With typical (i.e., incorrect) use, however,

first-year failure rates are considerably higher, at 9%. Even with perfect usage, other methods, such as condoms, diaphragms, and spermicides, have higher first-year failure rates than hormonal methods. And finally, although all methods of birth control have some potential adverse health effects, the associated risk is less than that of pregnancy.

Behavioral Methods

Behavioral methods involve regulating the timing or method of intercourse to prevent introduction of sperm into the female reproductive tract, either altogether or when an egg may be present. If used perfectly, the first-year failure rate may be around 3% to 4%. However, if behavioral methods are used poorly, first-year failure rates may approach 85%. The withdrawal method (also known as coitus interruptus) is the practice of ending intercourse before ejaculation. The main risk of the withdrawal method is that the man may not perform the maneuver in a timely manner. First-year failure rates vary from 4% with perfect usage to 22% with typical usage. Withdrawal is not considered birth control by some medical professionals.

Barrier Contraceptives

Barrier contraceptives are devices that attempt to prevent pregnancy by physically preventing sperm from entering the uterus. They include male condoms, female condoms, cervical caps, diaphragms, and contraceptive sponges with spermicide. Typically, modern condoms are made from latex, but some are made from other materials, such as polyurethane or lamb's intestine. Female condoms are also available and are usually made of nitrile, latex, or polyurethane. Male condoms and diaphragms with spermicide have typical-use first-year failure rates of 18% and 12%, respectively. With perfect use, condoms are more effective, with a 2% first-year

failure rate versus a 6% first-year rate with the diaphragm. Contraceptive sponges combine a barrier with a spermicide. Similar to diaphragms, they are inserted vaginally before intercourse and must be placed over the cervix to be effective. Typical failure rates during the first year depend on whether or not a woman has previously given birth (24% in those who have and 12% in those who have not). The sponge can be inserted up to 24 hours before intercourse and must be left in place for at least 6 hours afterward. There have been reports of allergic reactions and more severe adverse effects, such as toxic shock syndrome.

Women with cyanotic congenital heart disease and pulmonary hypertension are at risk for thrombotic events. Various barrier methods, such as condoms, are the safest form of contraception for these women.

Hormonal Contraceptives

Hormonal contraceptives are available in a number of different forms, including oral pills, implants under the skin, injections, patches, a vaginal ring, and IUDs (discussed separately later). There are two types of oral birth control pills: the combined oral contraceptive pills (which contain both estrogen and a progestogen) and the progestogen-only pills. If either is taken during pregnancy, they do not increase the risk of miscarriage, nor do they cause birth defects. Both types of birth control pills prevent fertilization mainly by inhibiting ovulation and thickening cervical mucus. Additionally, they may change the lining of the uterus and thus decrease implantation. Their effectiveness depends on the user's remembering to take the pills.

Combined hormonal contraceptives are associated with an increased risk of both venous and arterial blood clots. Venous clots, on average, increase from 2.8 to 9.8 per 10,000 women years, which is still less than that associated with pregnancy, for the average woman. Because of this risk, they are not recommended in women who have other risk factors for thrombosis, such as age older than 35 years, smoking, or heart disease.

Most progestin-only pills, injections, and IUDs are not associated with an increased risk of thrombosis and thus may be used by women with a history of venous thrombosis. In patients with a history of arterial blood clots, nonhormonal birth control or a progestin-only method other than the injectable version should be used. Progestin-only pills can be used by breastfeeding women because they do not affect milk production.

Progesterone-only pills may have androgenic side effects. The progestins drospirenone and desogestrel minimize the androgenic side effects but increase the risk of blood clots and should not be used in women at increased risk for thrombosis, such as those with pulmonary hypertension or Fontan circulation. Additionally, new evidence suggests that any form of oral contraceptive should be used with caution among women with congenital long QT syndrome, and progestin-only oral contraceptives have been associated with a 2.8-fold increased risk of cardiac events in women with long QT syndrome. Beta-blocker therapies are highly protective against this increased risk such that such women should be prescribed a beta-blocker if they choose to utilize any form of oral contraceptives.

Estrogen-containing contraceptives may produce nausea and breast tenderness. Irregular vaginal bleeding may occur with progestin-only methods, with some women experiencing no menstrual periods.

Monthly injectables that contain medroxyprogesterone acetate are inappropriate for women with congestive heart failure because they have a tendency to cause fluid retention. Low-dose oral contraceptives containing 20 μg of ethinyl estradiol are safe in women with low thrombogenic potential, but they must be used with extreme caution in women with vascular disease and a higher risk of thrombotic events.

Intrauterine Devices

Current IUDs are small apparatuses, often T shaped, typically containing either copper or levonorgestrel, that are inserted into the uterus. They are the most effective reversible type of birth control. Whereas the failure rate with the copper IUD is about 0.8%, the levonorgestrel IUD has a failure rate of 0.2% in the first year of use. IUDs do not affect breastfeeding and can be inserted immediately after delivery. They also may be used immediately after an abortion. After they are removed, even after long-term use, fertility returns to normal immediately. Although copper IUDs may increase menstrual bleeding and result in more painful cramps, hormonal IUDs may reduce menstrual bleeding or stop menstruation altogether. Cramping can be treated with nonsteroidal antiinflammatory drugs. Other potential complications include expulsion (2%–5%) and, rarely, perforation of the uterus (<0.7%). A previous model of the IUD (the Dalkon shield) was associated with an increased risk of pelvic inflammatory disease. However, this risk is not

increased with current models in women without sexually transmitted infections around the time of insertion.

After barrier methods, the levonorgestrel-releasing IUD is considered the safest and most effective means of birth control for women with cyanotic congenital heart disease and pulmonary hypertension (both of which increase the risk for thrombotic events). However, it is contraindicated in cyanotic women with hematocrit greater than 55% because of an increased risk of excessive menstrual bleeding. Implantation causes vasovagal syncope in about 5% of women, so IUDs must be used cautiously in very high-risk patients. Antibiotic prophylaxis is not recommended at insertion.

Surgical Sterilization

Surgical sterilization is available in the form of tubal ligation. There are no significant long-term side effects, and tubal ligation decreases the risk of ovarian cancer. Generally, tubal ligation is a low-risk procedure (complications occur in 1%–2% of procedures), but because of associated anesthesia and abdominal inflation, it may carry increased risk in patients with pulmonary hypertension, cyanosis, or Fontan circulation. Although sterilization is considered a permanent procedure, it is possible to attempt reversal by reconnecting the fallopian tubes. Pregnancy success rates after tubal reversal are between 31% and 88%. Tubal ligation reversal is associated with an increased risk of ectopic pregnancy.

Emergency Contraceptive Methods

Emergency contraceptive methods are medications or devices used after unprotected sexual intercourse with the hope of preventing pregnancy. They work primarily by preventing ovulation or fertilization. They are unlikely to affect implantation, but this has not been completely excluded. A number of options exist, including high-dose birth control pills, levonorgestrel, mifepristone, ulipristal, and IUDs. Levonorgestrel pills, when used within 3 days of intercourse, decrease the

chance of pregnancy after a single episode of unprotected sex or condom failure by 70% (resulting in a pregnancy rate of 2.2%). Ulipristal, when used within 5 days of intercourse, decreases the chance of pregnancy by about 85% (pregnancy rate of 1.4%) and might be a little more effective than levonorgestrel. Mifepristone is also more effective than levonorgestrel. Copper IUDs are the most effective method. IUDs can be inserted up to 5 days after intercourse and prevent about 99% of pregnancies after an episode of unprotected sex (pregnancy rate of 0.1%–0.2%). In women who are obese, levonorgestrel is less effective, and an IUD or ulipristal is recommended. All emergency methods have minimal side effects.

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