

TABLE 414-1 EFFECTIVENESS OF DIFFERENT FORMS OF CONTRACEPTION

Method of Contraception	Theoretical <sup>a</sup> Effectiveness, %	Actual <sup>a</sup> Effectiveness, %	Percent Continuing Use at 1 Year <sup>b</sup>	Contraceptive Methods Used by U.S. Women <sup>c</sup>
Barrier methods				
Condoms	98	88	63	18
Diaphragm	94	82	58	2
Cervical cap	94	82	50	<1
Spermicides	97	79	43	1
Sterilization				
Male	99.9	99.9	100	9
Female	99.8	99.6	100	27
Intrauterine device				
Copper T380	99	97	78	1
Progestasert	98	97	81	
Mirena	99.9	99.8		
Hormonal contraceptives				
Combination pill	99.7	92	72	31
Progestin only pill				
Transdermal patch				
Vaginal ring				
Monthly injection				
Long-acting progestins				

<sup>a</sup>Adapted from J Trussel et al: *Obstet Gynecol* 76:558, 1990. <sup>b</sup>Adapted from *Contraceptive Technology Update*. *Contraceptive Technology*, Feb. 1996, Vol 17, No 1, pp 13–24. <sup>c</sup>Adapted from LJ Piccinino, WD Mosher: *Fam Plan Perspective* 30:4, 1998.

No single contraceptive method is ideal, although all are safer than carrying a pregnancy to term. The effectiveness of a given method of contraception does not just depend on the efficacy of the method itself. Discrepancies between theoretical and actual effectiveness emphasize the importance of patient education and compliance when considering various forms of contraception (Table 414-1). Knowledge of the advantages and disadvantages of each contraceptive is essential for counseling an individual about the methods that are safest and most consistent with his or her lifestyle. The WHO has extensive family planning resources for the physician and patient that can be accessed online. Similar resources for determining medical eligibility are available through the Centers for Disease Control and Prevention (CDC). Considerations for contraceptive use in obese patients and after bariatric surgery are discussed below.

#### BARRIER METHODS

Barrier contraceptives (such as condoms, diaphragms, and cervical caps) and spermicides are easily available, reversible, and have fewer side effects than hormonal methods. However, their effectiveness is highly dependent on adherence and proper use (Table 414-1). A major advantage of barrier contraceptives is the protection provided against sexually transmitted infections (STIs) (Chap. 163). Consistent use is associated with a decreased risk of HIV, gonorrhea, nongonococcal urethritis, and genital herpes, probably due in part to the concomitant use of spermicides. Natural membrane condoms may be less effective than latex condoms, and petroleum-based lubricants can degrade condoms and decrease their efficacy for preventing HIV infection. Barrier methods used by women include the diaphragm, cervical cap, and contraceptive sponge. The cervical cap and sponge are less effective than the diaphragm, and there have been rare reports of toxic shock syndrome with the diaphragm and contraceptive sponge.

#### STERILIZATION

Sterilization is the method of birth control most frequently chosen by fertile men and multiparous women >30 years old (Table 414-1). Sterilization refers to a procedure that prevents fertilization by

surgical interruption of the fallopian tubes in women or the vas deferens in men. Although tubal ligation and vasectomy are potentially reversible, these procedures should be considered permanent and should not be undertaken without patient counseling.

Several methods of *tubal ligation* have been developed, all of which are highly effective with a 10-year cumulative pregnancy rate of 1.85 per 100 women. However, when pregnancy does occur, the risk of ectopic pregnancy may be as high as 30%. The success rate of tubal reanastomosis depends on the method of ligation used, but even after successful reversal, the risk of ectopic pregnancy remains high. In addition to prevention of pregnancy, tubal ligation reduces the risk of ovarian cancer, possibly by limiting the upward migration of potential carcinogens.

*Vasectomy* is a highly effective outpatient surgical procedure that has little risk. The development of azoospermia may be delayed for 2–6 months, and other forms of contraception must be used until two sperm-free ejaculations provide proof of sterility. Reanastomosis may restore fertility in 30–50% of men, but the success rate declines with time after vasectomy and may be influenced by factors such as the development of antisperm antibodies.

#### INTRAUTERINE DEVICES

IUDs inhibit pregnancy through several mechanisms, primarily via a spermicidal effect caused by a sterile inflammatory reaction induced by the presence of a foreign body in the uterine cavity (copper IUDs) or by the release of progestins (Progestasert, Mirena). IUDs provide a high level of efficacy in the absence of systemic metabolic effects, and ongoing motivation is not required to ensure efficacy once the device has been placed. However, only 1% of women in the United States use this method compared to a utilization rate of 15–30% in much of Europe and Canada, despite evidence that the newer devices are not associated with increased rates of pelvic infection and infertility, as occurred with earlier devices. An IUD should not be used in women at high risk for development of STI or in women at high risk for bacterial endocarditis. The IUD may not be effective in women with uterine leiomyomas because they alter the size or shape of the uterine cavity. IUD use is associated with increased menstrual blood flow, although this is less pronounced with the progestin-releasing IUD, which is associated with a more frequent occurrence of spotting or amenorrhea.

#### HORMONAL METHODS

**Oral Contraceptive Pills** Because of their ease of use and efficacy, oral contraceptive pills are the most widely used form of hormonal contraception. They act by suppressing ovulation, changing cervical mucus, and altering the endometrium. The current formulations are made from synthetic estrogens and progestins. The estrogen component of the pill consists of ethinyl estradiol or mestranol, which is metabolized to ethinyl estradiol. Multiple synthetic progestins are used. Norethindrone and its derivatives are used in many formulations. Low-dose norgestimate and the more recently developed (third-generation) progestins (desogestrel, gestodene, drospirenone) have a less androgenic profile; levonorgestrel appears to be the most androgenic of the progestins and should be avoided in patients with hyperandrogenism. The three major formulations of oral contraceptives are (1) fixed-dose estrogen-progestin combination, (2) phasic estrogen-progestin combination, and (3) progestin only. Each of these formulations is administered daily for 3 weeks followed by a week of