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Emergency Contraception

Emergency contraception, also known as postcoital contraception, is therapy used to prevent pregnancy after an unprotected or inadequately protected act of sexual intercourse. Women seeking emergency contraception typically are younger than 25 years, have never been pregnant, and have used some form of contraception in the past (1–3). Common indications for emergency contraception include contraceptive failure (eg, condom breakage or missed doses of oral contraceptives) and failure to use any form of contraception (2, 4, 5).

Although oral emergency contraception was first described in the medical literature decades ago, in 1998 the U.S. Food and Drug Administration (FDA) approved the first dedicated product for emergency contraception. Many women are unaware of the existence of emergency contraception, misunderstand its use and safety, or do not use it when a need arises (6–8). Increasing emergency contraception awareness and knowledge are important priorities in the effort to prevent unintended pregnancy.

Methods of emergency contraception include administration of progestin-only or combination estrogen–progestin oral contraceptives, synthetic and conjugated estrogens, antiprogestins, or the insertion of a copper intrauterine device (IUD). The purpose of this bulletin is to address the progestin-only and combined oral contraceptive methods (which are the most frequently used and the only methods currently approved by the FDA specifically for emergency contraception) and briefly address the use of the copper IUD because of its use as both long-term contraception and emergency contraception.

Background

Research on the postcoital use of contraceptive steroids began in the 1960s. The first oral regimen, which used a widely available brand of combined estrogen–progestin oral contraceptive pills, was published in 1974 by Yuzpe and colleagues (9). Research on progestin-only regimens for occasional postcoital use by women having infrequent intercourse also began about that time (10).

Regimens

The two most commonly used oral emergency contraception regimens are the combined estrogen–progestin regimen, which consists of two doses—each containing 100 micrograms of ethinyl estradiol plus 0.5 mg of levnorgestrel—taken 12 hours apart, and the progestin-only regimen, which consists of a total of 1.5 mg of levonorgestrel. The two levonorgestrel-only regimens available in the United States, specifically dedicated for emergency contraception, are the single-dose protocol and the two-dose protocol. The universal availability of dedicated emergency contraception products has been controversial, and these drugs are currently separated into over-the-counter and prescription-only access based on age (see Table 1).

The combined estrogen–progestin regimen can be formulated from a variety of standard oral contracep-

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Table 1. Over-the-Counter and Prescription-Only Emergency Contraception Products

Regimen	Formulation	Access
Two-dose regimen	2 tablets, each containing 0.75 mg levonorgestrel	Available only by prescription for women younger than 17 years, and available over-the-counter for women 17 years and older.
Single-dose regimen	1 tablet, containing 1.5 mg levonorgestrel	Available only by prescription for women younger than 17 years, and available over-the-counter for women 17 years and older.

tives (http://ec.princeton.edu/questions/dose.html#dose) (11), although data exist only for regimens containing levonorgestrel, norgestrel (levonorgestrel plus an equal amount of the inactive enantiomer dextronorgestrel), and norethindrone.

The two-dose progestin-only regimen instructs patients to take one 0.75-mg levonorgestrel pill as soon as possible after unprotected intercourse and to take the second 0.75-mg pill 12 hours after the first dose. However, the two 0.75-mg doses of the levonorgestrel-only regimen are equally effective if taken 12–24 hours apart, which may improve adherence (12, 13). The single-dose 1.5-mg levonorgestrel-only regimen is as effective as the two-dose regimen taken 12 hours apart (14, 15).

Other regimens have been proposed for use as emergency contraception, including single-dose ulipristal acetate, which has been shown to be effective in preventing pregnancy up to 120 hours after unprotected intercourse (16, 17). However, no other products are currently approved in the United States for emergency contraception.

Method of Action

No single mechanism of action has been established for emergency contraception; rather, the mode of action varies according to the day of the menstrual cycle on which intercourse occurs and emergency contraception is administered (18–21). Both the combined regimen and the levonorgestrel-only regimen have been shown to inhibit or delay ovulation (22–28). Earlier studies documented histologic and biochemical changes in the endometrium after administration of the combined regimen, suggesting that emergency contraception may alter the receptiveness of the endometrium and inhibit implantation of a fertilized egg (9, 25, 29–31). However, several more recent studies have not supported these findings (23, 26, 28, 32–36), and the endometrial changes that have been observed may not be sufficient to prevent implantation. Interference with sperm transport or penetration (10, 37) and impairment of corpus luteum function (25, 38) have been proposed as other possible mechanisms of action, but there is no direct clinical evidence to support these theories.

Emergency contraception is sometimes confused with medical abortion (39). However, whereas medical abortion is used to terminate an existing pregnancy, emergency contraception is effective only before a pregnancy is established. Emergency contraception can prevent pregnancy during the 5 or more days between intercourse and implantation of a fertilized egg, but it is ineffective after implantation. Studies of high-dose oral contraceptives indicate that emergency contraception confers no increased risk to an established pregnancy or harm to a developing embryo (40).

Side Effects

No deaths or serious complications have been causally linked to emergency contraception (41). Short-term side effects include the following:

- Nausea and vomiting—The levonorgestrel-only regimen is associated with significantly lower incidences of nausea and vomiting than the combined regimen (42, 43). Nausea and vomiting, respectively, occur in approximately 18% and 4% of women using levonorgestrel-only emergency contraception (14, 15, 43) and in approximately 43% and 16% of women using the combined regimen (44).
- Irregular bleeding—After emergency contraception use, the menstrual period usually occurs within 1 week before or after the expected time (43). Some patients experience irregular bleeding or spotting in the week or month after treatment; one trial of the levonorgestrel-only regimen found that 16% of women reported nonmenstrual bleeding in the first week after use (15). If emergency contraception is taken earlier in the cycle, it is more likely that a women will experience bleeding before the expected menses (45). Irregular bleeding associated with emergency contraception resolves without treatment.
- Other side effects—Some patients have reported experiencing short-term side effects, such as breast tenderness, abdominal pain, dizziness, headache, and fatigue (46).

Effects on Pregnancy

No studies have specifically investigated adverse effects of exposure to emergency contraception during early pregnancy. However, numerous studies of the teratogenic risk of conception during daily use of oral contraceptives (including older, higher-dose preparations) have found no increase in risk to either the pregnant woman or the developing fetus (47).

Existing data indicate that use of emergency contraception does not increase the chance that a subsequent pregnancy will be ectopic. Emergency contraception, like all other contraceptives, actually reduces the absolute risk of ectopic pregnancy by preventing pregnancy overall (48).

Barriers to Use

A prominent concern raised is that making emergency contraception more readily available could encourage irresponsible sexual behavior, which would increase the risks of unintended pregnancy (49). However, numerous studies have shown that this concern is unfounded. Several published randomized trials have evaluated the policy of providing emergency contraception to women at the time of a routine gynecologic visit, so that they will have the medication immediately available if a contraceptive mishap occurs (4, 50–56). These trials compared this policy of advance provision with a policy of instructing women to contact a clinician if emergency contraception is needed. All but one of these trials showed no difference between groups regarding self-reported frequency of either unprotected intercourse or use of contraception (54).

Surveys have documented that a large number of women are unaware of the existence of emergency contraception or have insufficient knowledge to allow them to use it effectively (57–62). The results of a survey of Californians between the ages of 15 and 44 years indicate that 35% of the participants did not know of any way to prevent becoming pregnant after sex, and 43% were not aware that emergency contraception is available in the United States (1). In a 2007 study, few women who received information about emergency contraception remembered discussing it after 12 months (63). Additionally, many health care providers are poorly informed about this method (64–66). In a 2008 U.S. survey, almost one in five practitioners were reluctant to provide education on the subject to sexually active adolescents (67). Finally, three studies evaluating female sexual assault victims seen in emergency departments indicated that only 21–50% of eligible women received emergency contraception (68–70). More studies to evaluate barriers to use in specific populations are needed, so that appropriate policy interventions can be implemented (71, 72).

Availability of emergency contraception has improved since it was approved for over-the-counter access for those 17 years and older. A study of 1,087 pharmacies in Philadelphia, Boston, and Atlanta found that even when availability was limited to behind-the-counter status (ie, being available without a prescription, but only after intervention by a pharmacist) the percentage of pharmacies unable to provide Plan B within 24 hours decreased from 23% in 2005 to 8% in 2007 (73). However, previously documented barriers such as limited access to emergency contraception through pharmacies, student health centers, urgent care centers, and other sources (72, 74) remain for women younger than 17 years. Consequently, health care providers need to pay particular attention to barriers for emergency contraception use for this at-risk population.

Clinical Considerations and Recommendations

▶ ***Who are candidates for emergency contraception?***

Emergency contraception should be offered or made available to women who have had unprotected or inadequately protected sexual intercourse and who do not desire pregnancy. The World Health Organization's "Medical Eligibility Criteria for Contraceptive Use" include no conditions in which the risks of emergency contraception use outweigh the benefits (75). These criteria note specifically that women with previous ectopic pregnancy, cardiovascular disease, migraines, or liver disease and women who are breastfeeding may use emergency contraception. Therefore, emergency contraception should be made available to women with contraindications to the use of conventional oral contraceptive preparations. Reproductive-aged women who are victims of sexual assault should always be offered emergency contraception.

▶ ***What screening procedures are needed before provision of emergency contraception?***

No clinical examination or pregnancy testing is necessary before provision or prescription of emergency contraception is provided. Emergency contraception should be offered or made available any time unprotected or inadequately protected intercourse occurs and the patient is concerned that she is at risk for an unwanted pregnancy.

Emergency contraception should not be withheld or delayed in order to test for pregnancy, nor should it be denied because the unprotected coital act may not have occurred on a fertile day of the menstrual cycle.

▶ *When should emergency contraception be initiated?*

Treatment should be initiated as soon as possible after unprotected or inadequately protected intercourse to maximize efficacy, which decreases with time (15, 34, 42, 76, 77). However, a few studies have not observed this time effect with the combined regimen (78, 79). Because earlier studies demonstrated that both regimens are effective when initiated up to 72 hours after intercourse (9, 43), product package instructions advise use only within that time frame. More recent studies have shown that emergency contraception is still moderately effective when the first dose is taken up to 5 days after intercourse and may be made available to patients who request it up to 5 days after intercourse (15, 78–83). There currently are no data evaluating the efficacy of emergency contraception when treatment is initiated more than 120 hours after intercourse.

▶ *How effective is emergency contraception in preventing pregnancy?*

For emergency contraception, efficacy is defined as the number of pregnancies observed after treatment divided by the estimated number of pregnancies that would occur without treatment. When this proportion is subtracted from one, the resulting statistic is the "prevented fraction," which represents the estimated percentage of cases averted by the treatment. Reported figures on the efficacy of emergency contraception vary considerably and are imprecise.

Six studies comprising a total of more than 8,000 women who used the levonorgestrel-only regimen calculated prevented fractions ranging from 60% to 94% (12, 14, 15, 42, 43, 84). Similarly, eight studies including a total of more than 3,800 women who used the combined regimen yielded prevented fractions ranging from 56% to 89%; a meta-analysis of pooled data from these studies concluded that the regimen prevents at least 74% of expected pregnancies (85).

Other data suggest that the levonorgestrel-only regimen is more effective than the combined regimen and has reduced side effects. The first of two randomized trials that directly compared the two regimens found no statistically significant difference in efficacy between failure rates of the levonorgestrel-only regimen and the combined regimen (2.4% versus 2.7%, respectively) (42). However, a second larger trial reported that the levonorgestrel-only regimen was significantly more effective for preventing pregnancy than the combined regimen (85% versus 57%, respectively) (43). Estimates based on combined data from these two studies show a reduced relative risk of pregnancy (0.51, 95% confidence interval, 0.31–0.83) with the levonorgestrel-only regimen (86). Therefore, the levonorgestrel-only regimen is preferred to the combined estrogen–progestin regimen, if available.

Multiple randomized-controlled trials have failed to demonstrate a reduction in unintended pregnancy or abortion with increased access to emergency contraception (87). These data highlight the importance of counseling patients about the appropriate use of emergency contraception as an episodic intervention rather than an effective long-term method. Information regarding long-term effective contraceptive methods should be made available whenever a woman requests emergency contraception. Use of highly effective long-acting reversible methods should be encouraged in appropriate patients.

▶ *Are antiemetics useful as an adjunct to treatment?*

Because the incidence of nausea and vomiting is low with the levonorgestrel-only regimen, prophylactic antiemetics are not necessary. With the combined regimen, antiemetic pretreatment may be beneficial because the incidence of nausea is reported to be 30–60% (88). A single dose of an antiemetic taken 1 hour before the first dose of emergency contraception has been shown to decrease the incidence or severity of nausea (89, 90). Taking emergency contraception with food does not appear to affect the risk of nausea (80, 89). No evidence exists that vomiting within 3 hours of taking the dose is associated with an increased failure rate; however, no studies were designed specifically to measure this effect. Many experts recommend that the emergency contraceptive dose should be repeated if vomiting occurs within 2 hours of taking an emergency contraceptive dose. If severe vomiting occurs, emergency contraception may be administered vaginally. Studies of vaginally administered combined oral contraceptive pills suggest that the hormones are effectively absorbed through the vaginal epithelium (91, 92).

▶ *Is emergency contraception safe if used repeatedly?*

Data are not available on the safety of current regimens of emergency contraception if used frequently over a long period. However, emergency contraception may be used more than once, even within the same menstrual cycle. Information about other forms of contraception and coun-

seling about how to avoid future contraceptive failures should be made available to women who use emergency contraception, especially those who use it repeatedly.

Emergency contraception is less effective than most other available methods for long-term contraception. In addition, continued use would result in exposure to higher total levels of hormones than those of either combined or progestin-only oral contraceptives, and frequent use also would result in more side effects, including menstrual irregularities. Therefore, emergency contraception should not be used as a long-term contraceptive.

▶ *What clinical follow-up is needed after use of emergency contraception?*

No scheduled follow-up is required after use of emergency contraception. However, the woman should be advised that if her menstrual period is delayed by a week or more, she should consider the possibility that she may be pregnant and seek clinical evaluation. A woman also should seek follow-up care for persistent irregular bleeding or lower abdominal pain because these symptoms could indicate a spontaneous abortion or an ectopic pregnancy. Women also should be advised about available resources if they need an ongoing contraceptive or other services, such as testing for sexually transmitted diseases, at the time emergency contraception is provided or at some convenient time thereafter.

▶ *When should regular contraception be initiated or resumed after use of emergency contraception?*

Treatment with emergency contraception may not protect against pregnancy in subsequent coital acts (15); in fact, because emergency contraception may work by delaying ovulation, women who have taken emergency contraception are at risk for becoming pregnant later in the same menstrual cycle. Women should begin using barrier contraceptives to prevent pregnancy (eg, condoms, diaphragms, and spermicides) immediately after taking emergency contraception. Short-term hormonal contraceptives (eg, pills, patches, and rings) may be started either immediately (with a backup barrier method) or after the next menstrual period. Long-term hormonal methods (levonorgestrel intrauterine system, depot medroxyprogesterone acetate, or progestin contraceptive implant) should be started after the next menstrual period, when it is clear that the patient is not pregnant.

▶ *When is an intrauterine device appropriate for emergency contraception?*

Use of a copper IUD for emergency contraception, first reported in 1976 (93), has been studied in prospective cohort trials with pregnancy rates of 0–0.1% (94). In these trials, the IUD was inserted up to 5 days after unprotected intercourse. A more recent report of 1,013 women who underwent insertion of a copper IUD for emergency contraception, including 170 nulliparous women, found a pregnancy rate of 0.2% (95). One advantage of using the copper IUD for emergency contraception is that it can be retained for continued long-term contraception. The same study found 86% of parous women and 80% of nulliparous women maintained the IUD for contraception. No randomized controlled trials have compared IUD insertion with medical regimens for emergency contraception. A recent meta-analysis concluded that the IUD is very effective for emergency contraception but that further comparative studies are needed (96).

The copper IUD is appropriate for emergency contraception in women who meet standard criteria for IUD insertion and is most effective if inserted within 5 days after unprotected intercourse. This method is particularly useful for women who desire long-term contraception and who are otherwise appropriate candidates for IUD use. The levonorgestrel-releasing intrauterine system is not effective as an emergency contraceptive (97).

Summary of Recommendations and Conclusions

The following recommendations are based on good and consistent scientific evidence (Level A):

- The levonorgestrel-only regimen is more effective and is associated with less nausea and vomiting; therefore, if available, it should be used in preference to the combined estrogen–progestin regimen.
- The two 0.75-mg doses of the levonorgestrel-only regimen are equally effective if taken 12–24 hours apart.
- The single-dose 1.5-mg levonorgestrel-only regimen is as effective as the two-dose regimen taken 12 hours apart.
- To reduce the chance of nausea with the combined estrogen–progestin regimen, an antiemetic agent may be taken 1 hour before the first emergency contraception dose.

The following recommendations are based on limited or inconsistent scientific evidence (Level B):

- Treatment with emergency contraception should be initiated as soon as possible after unprotected or inadequately protected intercourse to maximize efficacy.

- Emergency contraception should be made available to patients who request it up to 5 days after unprotected intercourse.
- No clinician examination or pregnancy testing is necessary before provision or prescription of emergency contraception.

The following recommendations are based primarily on consensus and expert opinion (Level C):

- Emergency contraception should be offered or made available to women who have had unprotected or inadequately protected sexual intercourse and who do not desire pregnancy.
- Emergency contraception may be made available to women with contraindications to the use of conventional oral contraceptive preparations.
- Clinical evaluation is indicated for women who have used emergency contraception if menses are delayed by a week or more after the expected time or if lower abdominal pain or persistent irregular bleeding develops.
- Information regarding effective long-term contraceptive methods should be made available whenever a woman requests emergency contraception.
- The copper IUD is appropriate for use as emergency contraception for women who desire long-acting contraception.
- Emergency contraception may be used more than once, even within the same menstrual cycle.
- To maximize effectiveness, women should be educated about the availability of emergency contraception.

Resources

The following lists are for informational purposes only. Referral to these sources and web sites does not imply the endorsement of the American College of Obstetricians and Gynecologists. These lists are not meant to be comprehensive. The exclusion of a source or web site does not reflect the quality of that source or web site. Please note that web sites are subject to change without notice.

Emergency Contraception Hotline: 1-888-NOT-2-LATE

World Wide Web Pages:

- The American Congress of Obstetricians and Gynecologists: www.acog.org
- Emergency Contraception: http://www.not-2-late.com
- Reproductive Health Technologies Project: http://www.rhtp.org/contraception/emergency/
- International Consortium for Emergency Contraception: http://www.cecinfo.org

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The MEDLINE database, the Cochrane Library, and the American College of Obstetricians and Gynecologists' own internal resources and documents were used to conduct a literature search to locate relevant articles published between January 1985–January 2010. The search was restricted to articles published in the English language. Priority was given to articles reporting results of original research, although review articles and commentaries also were consulted. Abstracts of research presented at symposia and scientific conferences were not considered adequate for inclusion in this document. Guidelines published by organizations or institutions such as the National Institutes of Health and the American College of Obstetricians and Gynecologists were reviewed, and additional studies were located by reviewing bibliographies of identified articles. When reliable research was not available, expert opinions from obstetrician–gynecologists were used.

Studies were reviewed and evaluated for quality according to the method outlined by the U.S. Preventive Services Task Force:

- I Evidence obtained from at least one properly designed randomized controlled trial.
- II-1 Evidence obtained from well-designed controlled trials without randomization.
- II-2 Evidence obtained from well-designed cohort or case–control analytic studies, preferably from more than one center or research group.
- II-3 Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments also could be regarded as this type of evidence.
- III Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.

Based on the highest level of evidence found in the data, recommendations are provided and graded according to the following categories:

Level A—Recommendations are based on good and consistent scientific evidence.

Level B—Recommendations are based on limited or inconsistent scientific evidence.

Level C—Recommendations are based primarily on consensus and expert opinion.

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