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Contraception and the obese woman

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Abstract

Purpose—Obesity has reached epidemic rates among U.S. women of reproductive age, many of whom want to use contraception. However, some forms of contraception can have adverse effects on an obese woman's health. This article explores risks of contraception available in the United States and provides clinical recommendations for use by obese women.

Data sources—Information was compiled by reviewing the scientific literature on contraception and female obesity using CINAHL, MEDLINE, PubMed search engines.

Conclusions—The evidence is largely supportive of combined oral contraceptive (COC) use in carefully screened obese women without known risks factors for cardiovascular disease. The efficacy of COCs may be slightly reduced in obese women because of increased body mass. Other types of hormonal contraceptives have varying safety and efficacy reports when used by obese women. Intrauterine devices do not have reduced efficacy nor increased risks for obese women but insertion may be more difficult. Obesity has no effect on efficacy of barrier methods of contraception.

Implications—Clinicians should conduct a careful history and physical exam with selected supporting laboratory tests when considering prescription of hormonal contraceptives for obese women. Obese women require health counseling to carefully follow directions for contraceptive use to avoid unintended pregnancy.

Keywords

Body mass index (BMI); clinical decision making; contraception; obesity; women's health

Introduction

Nearly half (49%) of pregnancies that occur yearly in the United States are unintended (Guttmacher Institute, 2012). Women who use contraception consistently and correctly account for only 5% of unintended pregnancies, but women who use contraception

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inconsistently or incorrectly account for 43% of all unintended pregnancies, approximately 25% of all yearly pregnancies (Finer & Henshaw, 2006; Guttmacher Institute, 2012). Further, more than a fourth (27%) of reproductive age women in the United States are overweight (body mass index [BMI] between 25 and 29.9) and 35% are obese (BMI greater than 30), for a total of 62% of women of childbearing age in the United States exceeding recommended weight guidelines (Centers for Disease Control and Prevention [CDC], 2011). Obesity increases the risks of developing type 2 diabetes, hypertension, coronary artery disease, and stroke (Ogden, Carroll, McDowell, & Flegal, 2007). These risks do not cease when overweight and obese women become pregnant, but rather increase the risks of pregnancy to the woman and child. Pregnancy in obese women carries greater risks for perinatal complications for mother and child than in normal weight women (Patel, Colella, Esaka, Patel, & Thomas, 2007). It is therefore incumbent on healthcare practitioners to appropriately prescribe contraception for obese women and counsel them on correct and consistent use of contraception.

Given the high rates of unintended pregnancies and overweight and obesity in U.S. women, as well as the increased risk for serious complications in obese women who become pregnant, it follows that effective contraception is very important to protect the health of the obese women of childbearing age. This article reviews the impact of obesity on a woman's fertility and her ability to become pregnant, the efficacy of available methods of contraception, and the impact of these methods on the risks of increasing obesity in women. Being overweight or obese may affect how well certain types of contraception, such as oral contraceptives (OCs), the transdermal patch, the vaginal ring, implants, and injectable methods prevent pregnancy (Lopez et al., 2010).

Impact of obesity on fertility

Obesity can have varying effects on a woman's fertility. The impact depends on the presence or absence of hormonal irregularities. Obesity may reduce the frequency of ovulation, which results in irregular menstrual cycles (Murthy, 2010). High levels of insulin, related to insulin resistance associated with obesity, can result in ovulatory dysfunction as well as lower levels of sex hormone-binding globulin (Wuntakal & Hollingworth, 2009). Higher levels of androgens are present in women who have abdominal/truncal obesity than in those who have peripheral obesity (Carmina, 2009). Adipose tissue converts elevated levels of androgens to estrogens impairing normal ovarian function. In addition to conversion of androgens to estrogens, adipose tissue also produces leptin in proportion to the percentage of fat in the body. These high levels of leptin inhibit ovarian follicular development. Higher levels of insulin, estrogen, and leptin all contribute to the possibly reduced fertility noted in obese women. Irregular menstrual cycles in obese women are one sign that fertility may be reduced because of obesity; however, obese women should not assume infertility because of lack of menstrual cycles. If a woman is obese but has regular menstrual cycles, indicating fertility, on average she takes the same time to conception when not using contraception as do women with normal weight (Richman, 2008).

Efficacy of OCs (combination and progestin-only) in obesity

Combination OCs (COCs) with both estrogen and progestin are the most popular form of hormonal contraception for all women, including obese women, and the most popular form of reversible contraception in the United States (Mosher, Martinez, Chandra, Abma, & Wilson, 2004). Although OCs have been posited as less effective in obese women than in normal weight women because of dilution in the larger blood volume and fat mass or inadequate suppression of the hypothalamic-pituitary-ovarian axis (Edelman et al., 2009), this conclusion is debated by other researchers and clinicians. Other proposed mechanisms for the effect of obesity on drug metabolism include alterations of steroid metabolism because of increased basal metabolic rate, increased hepatic enzyme metabolism, and increased drug sequestration in fat mass (Murthy, 2010). This was illustrated in a prospective cohort study of 20 obese and normal weight women (Edelman et al., 2009). The clearance of ethinyl estradiol (EE), the most commonly used synthetic estrogen in COC, and levonorgestrel (LNG), a common progestin used in COC, was altered in obese women. This alteration resulted in higher levels of follicle-stimulating hormone and luteinizing hormone, indicating a potential for ovulation to occur with low-dose COC or missed pills. The half-life of LNG was significantly longer and concentrations were lower in obese women (Edelman et al., 2009). A different study with a retrospective design of 755 randomly selected women using OCs concluded that women in the highest weight quartile (>70 kg) had the highest number of pregnancies, and the risk for pregnancy was highest among women who were using COC with ≤35 mcg of estrogen (Holt, Scholes, Wicklund, Cushing-Haugen, & Daling, 2005).

Population-based studies of the effects of obesity have had conflicting outcomes. Using the 2002 National Survey of Family Growth sample of 7643 women aged 15–44 years, the outcome of unintended pregnancy was correlated with BMI. No significant differences in unintended pregnancy were found between women in normal, overweight, or obese BMI categories, even with adjustments for age, marital status, and race/ethnicity (Kaneshiro, Edelman, Carlson, Nichols, & Jensen, 2008). In contrast to these findings, a case-cohort study using data from the 1999 Behavioral Risk Factor Surveillance System (BRFSS) and the 2000 Pregnancy Risk Assessment Monitoring System (PRAMS) examined the association between BMI and COC failure (Brunner Huber, Hogue, Stein, Drews, & Zieman, 2006). The sample included 358 women, of whom 153 were cases and 205 were cohort. The odds ratio (OR) for COC failure showed a dose response by BMI, with an OR of 2.54 (1.18–5.50 confidence interval [CI]) for overweight (BMI >25) and OR of 2.82 (1.05–7.58 CI) for obese women. The authors also examined unintended pregnancy among women using contraception (cases) and not using contraception (controls) in the 1999 PRAMS survey (Brunner Huber, & Hogue, 2005). There was no association between BMI and unintended pregnancy among women who were not using contraception at the time of conception. But among women using contraception, the odds of having an unintended pregnancy increased with increasing BMI. Women with a BMI of 25–29.9 had an OR of 1.73 (1.26–2.36 CI) and women with a BMI > 30 had an OR of 1.75 (1.21–2.52 CI) for unintended pregnancy, compared to normal weight women. One limitation of this study was a lack of information about the type of contraception being used at the time of unintended

conception. These conflicting results reveal that the odds of pregnancy for an obese woman using a COC vary from none to 2.8 times higher risk. Edelman et al. (2009) reported that a study of pharmacokinetics of COC demonstrated it may take 3–5 days longer to reach a steady state of hormone levels that protect against pregnancy in obese versus nonobese women. This delay may mean that it will take longer for obese women to be protected from pregnancy when starting COC, indicating the need to use a backup method for a longer time.

A recent review of the literature on BMI and COC failure (Trussell, Schwarz, & Guthrie, 2009) found two studies that concluded that obesity increases the risk of COC failure and six studies that concluded obesity does not increase the risk of COC failure. The authors of the review did not find convincing evidence that obese women are at higher risk of COC failure with perfect use, but noted that imperfect use may result in COC failure because the metabolism of COC in obese women provides a smaller “margin of error.” Only prospective clinical trial data are likely to convincingly answer the question of whether COC failure is related to obesity.

Weight changes with OCs

Women may complain about weight gain when taking COC. A systematic review of 40 studies that compared COC found no differences in weight between women using or not using COC (Gallo, Grimes, Schultz, & Helmerhorst, 2004). The three randomized controlled trials included in the review did not find evidence to support the view that COC cause weight gain. A recent comparison of depo-medroxyprogesterone acetate (DMPA) injection, COC, and nonhormonal contraceptives found that women using COC did not gain weight but increased their percentage of body fat and decreased their percentage of lean body mass (Berenson & Rahman, 2009). The authors of the study observed that over the 3 years of observation, the women became less active, which could have accounted for the loss of lean body mass. Most women gain weight as they age (Keller et al., 2010), and they may mistakenly attribute their weight gain to COC rather than a change in activity levels.

Safety of COCs in obese women

There is also controversy concerning the safety of COC for obese women (Grimes & Shields, 2005). One of the well known adverse effects of COC is increased risk of venous thrombosis, especially during the first year of use. Obesity also is associated with increased risk of deep vein thrombosis (DVT) and pulmonary embolism (PE) in women; this appears to be a stronger risk factor in women under 40 years of age than in older women. The number of patients discharged from hospitals from 1979 to 1999 with the diagnoses of obesity and DVT or PE were examined using the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) to classify obesity, DVT, and PE (Abdollahi, Cushman, & Rosendaal, 2003). Among obese women who took OCs, the relative risk (RR) of DVT increased to 9.8. One reason for the increased risks of DVT and/or PE among obese women may be higher levels of plasminogen activator inhibitor-1, which is also present in diabetes and the metabolic syndrome. The use of COC in women with obesity has been rated as generally safe by the World Health Organization (WHO) when the benefits of contraception outweigh the risks of use—that is, when the risks of pregnancy in

obese mothers are greater than the risks of contraception (Trussell, Guthrie, & Schwarz, 2008). Prescribers in the United States generally follow the WHO guidelines and do not consider obesity alone a contraindication to COC use. In the United Kingdom, use of COC by women who have a BMI of 30–34.9 is generally viewed as safe, but their use is discouraged when the BMI is 35–39 because the risks of use are judged to outweigh the benefits, and for a BMI of ≥40, COC are viewed as an unacceptable health risk (Trussell et al., 2008).

The type of COC, specifically the type of progestin, and the risks of DVT and PE have been examined for several decades. EE is the most common estrogen used, but the progestin component can be one of eight forms, not all of which are available in the United States. Several studies in the past decade have examined the rates of thrombosis in COC containing desogestrel, norgestimate, or gestodene (often considered “third generation” progestins) and have found increased thrombotic risk among all women (Vandenbroucke et al., 2001). Recent case control and cohort studies have re-examined the risks of thrombosis with the use of third-generation progestins. A case control study of 1524 cases of thrombosis in women using COC compared to 1760 controls without thrombosis who were also using COC found that the risks of thrombosis were slightly higher with desogestrel and drospirenone. The risks were six to seven times higher for women using third-generation progestins than for nonusers of COC, compared to a five times greater risk with any form of COC than for nonusers (van Hylckama Vlieg, Helmerhorst, Vandenbroucke, Doggen, & Rosendaal, 2009). A cohort study examining the risks for DVT with hormonal contraception (Lidegaard, Løkkegarrd, Svendsen, & Agger, 2009) demonstrated that COC with desogestrel, gestodene, or drospirenone were associated with approximately 86% higher risks of thrombosis than COC containing LNG or norgestrel. Although the risks for venous thromboembolism (VTE) are higher for women using COC, DVT events remain rare.

Recommendations for use of COC in obese women

A family history of thromboembolism is an important risk factor to note when considering the use of COC in all women, especially obese women. Age, smoking, and risks of pregnancy are other factors to consider in advising obese women about contraceptive choices. The risks of thrombosis increase with age, and smoking is an independent risk factor for thrombosis. Obesity, smoking, COC, and age >35 may be a lethal combination that should be avoided. If a COC is the chosen form of contraceptive, a 35 mcg estrogen dose (to avoid unplanned pregnancy) combined with a low dose of LNG (to reduce the risk of thrombosis) appears to be the first choice (Lidegaard et al., 2009). However, for obese women, the use of COC can be lower than the risks of pregnancy and it is important for the practitioner to consider the woman's risk of pregnancy versus the small chance of risks from thromboembolic complications. See Table 1 for a comprehensive summary of safety and efficacy concerns for all contraceptives and obesity.

Progestin-only contraceptive pill

Although progestins in the COC pill contribute to higher risk of thrombosis, especially in obese women, no similar risk exists for obese women who take the progestin-only pill

(POP). Numerous studies have shown that the POP does not increase the risk of thrombosis or cardiovascular disease (Mansour, 2004), so a POP may be a safe alternative for an obese woman who is concerned about the risks of thromboembolism and cardiovascular disease. A recent study of more than 50,000 women found no association between obesity and the efficacy of POP (Dinger et al., 2009). The POP requires a woman to be more vigilant than users of COC about proper use in taking the POP daily (preferably at the same time each day and using backup method at any time a pill is missed) because it has slightly lower efficacy than the COC even with perfect use.

Contraceptive vaginal ring

The contraceptive vaginal ring (CVR) on the market contains 15 mcg EE and 120 mcg etonogestrel (related to desogestrel), although a formulation with a new progestin is currently in clinical trials. The CVR is inserted into the vagina by the user and remains in place for 21 days; it is then removed for 7 days to allow for withdrawal bleeding, which is similar to the COC pill and transdermal patch. Women who use the CVR are exposed to lower doses of EE than women who use COC or the transdermal patch (van den Heuvel, van Bragt, Alnabawy, & Kaptein, 2005), but the exposure is more stable and precise. A prospective clinical trial compared 31 overweight or obese women who used COC to 34 similar women who used the CVR; at the conclusion of the study 6 months later, the COC group had greater insulin resistance than the CVR group (Elkind-Hirsch, Darensbourg, Ogden, Ogden, & Hindelang, 2007). The CVR may thus be a preferred method for obese women because it exposes them to lower doses of EE, has fewer side effects related to insulin sensitivity, and is not affected by body weight. However, the CVR may be more difficult for obese women to insert and remove correctly. The efficacy of the CVR is similar to the COC; its failure rate is 0.3% with perfect use and 9% with typical use (Trussell, 2011). It is hypothesized that the hormone levels for the CVR may be higher in obese women than for the COC because the hormones are directly absorbed into the vaginal mucosa and avoid first-pass metabolism in the liver as occurs with the COC (Murthy, 2010).

The transdermal patch

The transdermal patch contains EE and norelgestromin (related to norgestimate). One fresh patch is placed by the user weekly for 3 weeks anywhere on the body except the breasts. Then 1 week is patch-free to allow for withdrawal bleeding. A systematic review (Lopez, Grimes, Gallo, & Schultz, 2008) found that the patch produced more side effects than the COC or CVR, and a cohort study revealed twice the risks of DVT and PE among patch users as among COC users (Cole, Norman, Doherty, & Walker, 2007). Obesity appears to reduce the effectiveness of the patch, and the patch has been found to be less effective in women weighing more than 90 kg, who may or may not be obese depending on their height. The transdermal patch may thus not be a first choice for obese women. For obese women who prefer the transdermal patch even after appropriate risk counseling, the provider may also discuss the use of secondary methods such as male condoms to decrease the risks of pregnancy and thoroughly counsel the woman on the early signs of DVT and PE.

Depot-medroxyprogesterone acetate (DMPA injection)

DMPA comes in intramuscular injection (IM) and subcutaneous (SQ) forms. The dose for injectable DMPA is 150 mg/1 mL IM every 3 months or 13 weeks (Pfizer, 2010). The dose for SQ DMPA is 104/0.65 mL, also given every 3 months or 12–14 weeks (Pfizer, 2009). Both IM and SQ DMPA provide highly effective contraception, with typical failure rates of ≤3%, and both are thought to be as effective in obese women as in normal weight women (Pfizer, 2009, 2010). Prescribing information for both IM and SQ DMPA reports rare serious thrombotic occurrences in women on the IM form, though no causal association (Pfizer, 2009, 2010); no such report is noted for SQ DMPA. DMPA does not contain estrogen, so for obese women who may be at risk for DVT or PE, DMPA is safer than contraceptives containing estrogen (Gordon, Thakur, Atlas, & Januchowski, 2007).

A major concern regarding both IM and SQ DMPA is potential hypoestrogenic effects on bone mineral density (BMD), especially when administered for ≥2 years (Curtis & Martin, 2006; Kaunitz & Grimes, 2011; Pfizer, 2009, 2010). The U.S. Food and Drug Administration (FDA) placed a black box warning on the injectable form in 2004 to this effect (Curtis & Martin, 2006). Currently, warnings on both IM and SQ DMPA note a gap in knowledge regarding their use and BMD in adolescents or young adult women, and prescribing information for both forms continues to carry a warning of potential BMD loss, worsening with longer treatment time (>2 years), which may not be fully reversible (Pfizer, 2009, 2010). Concerns about effects on BMD in adult women are also noted (Kaunitz & Grimes, 2011; Pfizer, 2009, 2010).

In contrast to the FDA, the WHO released a statement urging no restrictions on DMPA usage, including its duration, in women 18–45 years of age for whom it is otherwise indicated, stating advantages of DMPA in adolescents <18 years old and women >45 years old outweighed “theoretical safety concerns regarding fracture risk” (WHO, 2005, p. 304). There have been calls by some to remove the FDA black box warning (Kaunitz & Grimes, 2011). But, although numerous studies have examined DMPA effects on skeletal health, some controversy still exists (Viola et al., 2011). Prescribing information for IM DMPA describes BMD changes in adult women using injectable DMPA up to 5 years, with only partial recovery to baseline, as well as significant BMD changes in 12–18 year old girls using DMPA, with incomplete recovery to baseline (Pfizer, 2010). Prescribing information for SQ DMPA reports a study that compared BMD loss in adult women receiving IM versus SQ DMPA for 2 years; although both groups lost BMD, there was no significant difference in the two groups' mean BMD loss (Pfizer, 2009).

Several systematic reviews have suggested that bone loss associated with IM DMPA exists but is reversible once women no longer receive it. Curtis's and Martin's (2006) systematic review of 39 studies of progestin-only contraception effects on women's bone health concluded: (a) in cross-sectional studies, although mean BMD in DMPA recipients was lower than mean BMD in nonrecipients, the one standard deviation difference in the two groups rendered it difficult to determine the clinical importance of this finding; and (b) in longitudinal studies, BMD tended to decline over time in DMPA recipients, but recipients regained BMD upon DMPA cessation. However, Viola and colleagues (2011) recently

studied BMD in 232 Brazilian women using the IM form of DMPA uninterruptedly from 1 to 15 years and a matched group of 232 women with a copper intrauterine device (IUD). Viola et al. reported significantly lower BMD in women receiving DMPA versus women with a copper IUD at 13–15 years, but suggested duration of DMPA for ≤12 years was not related to low BMD. Viola et al. (2011) suggested their findings might be useful to countries with black box warnings for injectable DMPA and to inform women's and health professionals' decisions about contraceptive choices. Adequate intake of calcium and vitamin D is recommended for women receiving DMPA (Pfizer, 2009, 2010), as well as use of other measures typically thought to maintain bone health (weight-bearing exercise, e.g.).

Although there are also other risks to DMPA (see prescribing literature), another side effect of DMPA of interest to women is weight gain. Berenson and Rahman (2009) found that DMPA users gained on average 4.4 kg in 2 years and 5.1 kg in 3 years. Prescribing information for the IM form reports that women with mean initial body weights of 136 pounds added an average of 5.4, 8.1, 13.8, and 16.5 pounds after 1, 2, 4, or 6 years of therapy (Pfizer, 2010). Prescribing information for the SQ form notes mean weight gains similar to that of the IM form (Pfizer, 2009). A study of 97 girls (12–18 year old) receiving DMPA identified 21% as having early weight gain (defined as >5% above baseline) after 6 months of treatment (Bonny, Secic, & Cromer, 2011). Because findings indicated that early gainers had significantly higher changes in BMI at 12 and 18 months follow-up ($p < .001$) than those who were not early gainers, the researchers suggested early weight gain at 6 months may be a strong indicator of women at greater or lesser risk to gain excessive weight because of DMPA (Bonny et al., 2011). For girls or women already overweight or obese, weight gain can be a significant deterrent to initially choosing or continuing DMPA use. In addition, DMPA users had an increase in visceral fat, which is most metabolically active in promoting dyslipidemia. In a study comparing insulin sensitive normal weight and obese women, and insulin resistant normal weight and obese women, visceral fat was the most important predictor of insulin sensitivity/resistance (Jennings et al., 2008). DMPA may promote weight gain through its suppression of endogenous estrogen because hypoestrogenemia (e.g., menopause) has been linked to visceral fat and weight gain. Findings linking DMPA to weight gain or to higher risks of excessive weight gain suggest that DMPA recipients should be monitored for BMI after 6 month and regularly thereafter and should receive personal and appropriate health counseling related to exercise and nutrition.

Implant

The current implantable contraceptive on the market is a single-rod device containing 68 mg of etonogestrel (a third-generation progestin), which is slowly released for 3 years, at which time it is no longer considered effective (Adams & Beal, 2009). The implant is as highly effective as sterilization and has the same side effect profile of other progestin-only contraceptives, primarily irregular bleeding. The most common side effect reported by women with radio opaque or nonradio opaque etonogestrel implant is irregular menstrual bleeding; among other effects is weight gain (Organon, 2008, 2011). Its contraceptive efficacy in obese women was not studied during the clinical trials because women who weighed more than 130% of ideal body weight were excluded from the trials. Plasma levels

of etonogestrel were found to be lower in obese women than in normal weight women undergoing a pharmokinetics study although the levels were not statistically significantly different, and the authors concluded that the lower levels do not imply lessened contraceptive effectiveness (Mornar et al., 2012). The prescribing information (Merck, 2012) notes that it may be less effective in obese women who concomitantly use hepatic enzyme-inducing medications. It is inserted subdermally just under the skin at the inner side of the nondominant arm, and must be removed by the end of the third year of use.

Intrauterine device

IUDs have not been shown to affect weight in women (Hassan, Petta, Aldrighi, Bahamondes, & Perotti, 2003). When women who are using IUDs complain of weight gain, it is most likely because of aging, given that basal metabolic rate decreases 2% each decade after 18 years of age, or lifestyle. IUDs can be an effective contraception for obese women, especially those who want to avoid weight gain and estrogen-related side effects. The LNG-releasing IUD may be the preferred choice for obese women, as the progestin protects the endometrium from the development of hyperplasia from long-term exposure to excess estrogen related to obesity. The impact of obesity on an IUD is primarily on the difficulty of insertion. Determining the size and direction of the uterus and completely visualizing the cervix can be more difficult in obese women. The use of ultrasound may be helpful (Weisberg, 2010), as well as an examination table with a higher weight capacity and longer instruments (Amitasrigowri, 2010; Rodriguez & Edelman, 2011), along with insertion by a skilled practitioner with experience with IUD insertions.

Bariatric surgery and contraception

It is recommended that women who undergo bariatric surgery delay conception during the time of rapid weight loss, usually during the first year after surgery, although studies have not shown an adverse effect on an infant if pregnancy was not delayed (Gidiri & Greer, 2011). Post-surgery, the effectiveness of oral contraception may be altered from malabsorption related to the surgery and other hormonal methods of contraception are preferred (Gidiri & Greer, 2011). The rapid weight loss after surgery often results in improved fertility and if an obese woman is planning on bariatric surgery, she should be appropriately counseled on contraception even if she was not using any prior to the surgery if she wants to avoid pregnancy.

Lactational amenorrhea method (LAM)

LAM relies on the finding that the majority of women who breastfeed their babies exclusively with no supplemental formula or other foods do not resume menstruation for 6 months or more postpartum, and may continue to be anovulatory for much longer (Heinig, Peerson, & Dewey, 1994). This lactational infertility is thought to be due to the inhibitory effect of suckling on pulsatile gonadotropin releasing hormone secretion (McNeilly, Tay, & Glasier, 1994). Based on this, a system of contraception termed LAM was developed requiring three criteria for maximal (98%) effectiveness. First, the baby must be less than 6 months old; second, the mother must not have had a return of menses (defined as two contiguous days of bleeding, two contiguous days of spotting and one day of bleeding, or

three contiguous days of spotting); and third, the mother is exclusively breast-feeding her baby with no more than 4 h between day-time feeds and no more than 6 h between nighttime feeds and no more than 10% of calories coming from supplementation with infant formula or complementary food (Peterson et al., 2000). Once one of these conditions is no longer met, the effectiveness of LAM for contraception decreases, and women should be advised to use a backup method of contraception.

For exclusively breastfeeding obese women, LAM may be an attractive no cost, noninvasive, and breastfeeding-compatible contraceptive option up to 6 months postpartum (Hight-Laukaran et al., 1997). While earlier studies supported the idea that the return of menses in lactating women was dependent on the intensity of nursing, recent research on the metabolic-load hypothesis suggests that nursing intensity, exercise, and nutritional status all contribute to the resumption of fertility in lactating women (Valeggia & Ellison, 2009). This theory agrees with several studies indicating that higher maternal nutritional status or BMI correlates with earlier return of menses during lactation (Heinig et al., 1994; Lunn, 1994). No studies have specifically examined the duration of lactational amenorrhea in obese women; however, the aforementioned work suggests that obese women may have shorter duration of lactational amenorrhea. As obese women also have more trouble initiating and maintaining exclusive breastfeeding, it may be particularly important that they follow all the above criteria to have the full contraceptive protection of LAM.

Barrier contraceptives

Barrier methods of contraception are alternate options for pregnancy prevention for obese women as they are not weight dependent and do not cause systemic side effects. However, they are less effective in pregnancy prevention than hormonal contraception (Amitasrigowri, 2010). The most commonly used barrier methods are condoms, spermicides, cervical caps, IUDs, and diaphragms (Amitarsigowri, 2010). Male and female condoms have a 95% effectiveness rate of pregnancy prevention with correct and consistent use (National Guideline Clearing House, 2008). Nonoxynol-9 spermicides alone are not considered effective methods, as with typical use (average degree of consistency and correctness in use) there is only a 72%–82% effectiveness rate of pregnancy prevention (CDC, 2012).

The vaginal sponge, a single-use, one-size, nonprescription barrier contraceptive, combines the use of a spermicide with a physical barrier to shield the cervix. A major advantage of the sponge is its over-the-counter availability while the major disadvantages are risk of vaginal irritation and dryness and difficulty in removal. An unintended pregnancy rate of 9% in nullparous and 32% in multiparous women has been reported (Yranski & Gamache, 2008).

The cervical cap, resembling a sailor's hat, covers the cervix and is used with spermicide placed in the bowl and brim of the cap. The cap is available by prescription only with prescription size based on obstetrical history. An advantage of the cap is its lower rate of urinary tract infection in comparison to the diaphragm, while a disadvantage is the need to be fitted for prescription. Unintended pregnancy rates for the cervical cap with spermicide among nulliparous women are 9% with perfect use and 16% with typical use. Among

multiparous women, the unintended pregnancy rate is 26% with perfect use and 32% with typical use (Yranski & Gamache, 2008).

A recently approved barrier device (Lea's Shield®) is a reusable cervical barrier used with a spermicide. Advantages of this device are that it comes in only one size and can be washed, air dried, and stored for up to 6 months. Disadvantages are that it requires a prescription and has an increased risk of urinary tract infections and dislodgement during intercourse and a 14% overall failure rate (Yranski & Gamache, 2008).

The diaphragm is a flexible silicone or latex dome-shaped device used with spermicide and inserted into the vagina covering the cervix. Advantage of the diaphragm is that it can be inserted 6 h before intercourse. Disadvantages are increased rates of urinary tract infections, vaginal candidiasis, and bacterial vaginosis. Additional disadvantages are a fitting for correct size, the need for a prescription, and refitting after full-term pregnancy, abdominal or pelvic surgery, miscarriage or second-trimester abortion, and a weight change of 20% or more. The rate of unintended pregnancy with typical diaphragm use is 12% (Association of Reproductive Health Professionals, 2011). Severely obese women may have difficulty in correct placement of female condoms, spermicides, cervical caps, and diaphragms therefore decreasing the effectiveness of these barrier methods of contraception (Curtis, 2010).

Emergency contraception

Emergency contraception (EC) is the term for any contraception that can be used after coitus to prevent pregnancy from occurring. The most common form of EC is a single oral pill containing 1.5 mg of LNG or two pills containing 0.75 mg of LNG each, taken 12 h apart (Devine, 2012). LNG is most effective when taken as close as possible to the timing of intercourse and within 72 h of coitus. An important benefit of the LNG pills is that they are available without a prescription. Another oral method of EC is 30 mg of ulipristal acetate, which is effective in preventing pregnancy for up to 5 days after coitus. It is only available from a family planning center when a licensed practitioner is available to provide it to the woman (Devine, 2012). All three forms of oral EC work by preventing ovulation and/or fertilization (ACOG, 2010).

One highly effective method of EC is the insertion of a copper IUD, which prevents pregnancy for up to 7 days after coitus and can remain in place as a highly effective method of contraception for 10 years. The copper IUD has a pregnancy prevention rate of 99%, which makes it the most effective method of EC. However, it costs approximately $500 and should be used with women who do not have a pelvic infection or exposure to multiple sexual partners, which can increase the risk of pelvic infections. The copper IUD is believed to prevent pregnancy by interfering with implantation and altering the endometrium (Lindberg, 1997).

Pregnancy should be ruled out before provision of EC, although the LNG pills do not harm a developing embryo and there are no contraindications to its use for any women. The use of EC should be discussed with all women, especially those who rely on barrier methods of contraception. It is a good practice to provide obese women using barrier methods with an

oral EC backup to have at home in case of condom breakage or slippage, or coitus occurring when the barrier is not available.

Sterilization

Tubal ligation, in the form of laparoscopy, minilaparotomy, and transcervical sterilization, are the most commonly reported procedural methods of contraception by obese women (Schraudenbach & McFall, 2009). Laparoscopic tubal ligation, a highly effective option for all women, however, is associated with increased risk of complications among obese women (RR 1.7; 95% CI, 1.2–2.6; Jamieson et al., 2000). Associated common surgical complications among this population include difficulty in the delivery of anesthesia and visualization of the fallopian tubes, technical failure in fallopian tube occlusion, lengthier operation time, intra-abdominal organ damage, wound infection, hematoma and hemorrhage, and prolonged hospitalization (Cochrane, Gebbie, & Loudon, 2012; Rodriguez & Edelman, 2011).

Transcervical hysteroscopic sterilization (with a microinsert device inserted into the fallopian tube), less likely to be affected by BMI, not requiring general anesthesia or entry into the abdominal cavity, and with lower rates of surgical complications, is an effective alternative to laparoscopy for obese women (Cochrane et al., 2012). Minilaparotomy (a 2–5 cm abdominal incision above the pubic hairline through which the fallopian tubes are lifted out for occlusion) has been noted to be more effective among nonobese women than obese women and is a more difficult procedure to perform among the obese (Pelosi & Pelosi, 2004). The use of a self-adjusting, soft sleeve-type, self-retaining tissue retractor adapting to variations in wound depth makes this a more effective and less difficult procedure to perform among obese women (Pelosi & Pelosi, 2004). Sterilization of male partners, a highly effective method with minimum risks, may be another option for obese women who have completed their families (Rodriguez & Edelman, 2011; Weisberg, 2010).

Recommendations for contraception for obese women

The evaluation for contraception for an obese woman should include a personal, social, family, and medical history that includes noting the presence of contraindications to hormonal contraceptives (specifically the contraindications to use of estrogens) and IUDs. If no contraindications are present based on history, a woman's risk for pregnancy should be noted, based on frequency of intercourse, prior fertility, and her own desires for avoiding conception. After a complete physical examination, along with appropriate laboratory studies as indicated by the history and physical finding, the full range of contraception that is appropriate for the woman should be offered to her, if possible. An obese woman should be encouraged to make her decision about contraception based on her own circumstances after all the risks and benefits of all the methods have been fully and appropriately addressed.

Realistic risks

Unintended pregnancy remains a significant issue in the United States (Curtis, Tepper, & Marchbanks, 2011). Although staying clinically current is a professional necessity, it may be

difficult for busy health professionals to remain up to date on the latest research finding for all aspects of their practice. Some clinicians may rely heavily on prescribing information and national organizations or guidelines to guide them. Evidence-based publications, such as the U.S. Medical Eligibility for Contraceptive Use, 2010, are yet another tool (Curtis et al., 2011). While guidelines and warnings correctly attempt to portray risks, health professionals should also consider the absolute risks for adverse effects of pregnancy, especially unplanned, upon women's health, social, professional, economic, and personal outcomes (Curtis et al., 2011; Freeman & Shulman, 2010). In addition, health professionals must consider the additional pregnancy-related risks in women at the beginning and end of the contraceptive poles, those who are older and/or overweight (Cochrane et al., 2011), as well those who are adolescent at risk for unplanned pregnancies (Kaneshiro & Edelman, 2011).

Health professionals whose practice includes frank, informed, and unbiased discussions with their women patients about each woman's health needs and choices, as well as about women's contraceptive options and contraception risks, can be of great assistance to patients. Current information and sensitive and proactive counseling should be offered at each patient visit, beginning initially when women seek health care and continuing thereafter with every appointment. Encouraging women to communicate their needs and concerns and making efforts to address these as soon as possible will ultimately improve patient satisfaction and adherence, lead to early recognition of problems, and serve as guide for recommendations for appropriate interventions to ultimately improve women's health.

References

Abdollahi M, Cushman M, Rosendaal F. Obesity: Risk of venous thrombosis and the interaction with coagulation factor levels and oral contraceptive use. Thrombosis & Haemostasis. 2003; 89(3):493–498. [PubMed: 12624633]

Adams K, Beal MW. Implanon: A review of the literature with recommendations for clinical management. Journal of Midwifery & Women's Health. 2009; 54(2):142–149.

American College of Obstetricians and Gynecologists. ACOG Practice Bulletin No. 112: Emergency contraception. Obstetrics & Gynecology. 2010; 115(5):1100–1119. [PubMed: 20410799]

Amitasrigowri SM. Obesity and contraception: Emerging issues. Seminars in Reproductive Medicine. 2010; 28(2):156–163. [PubMed: 20352564]

Association of Reproductive Health Professionals. Choosing a birth control method: Intrauterine contraception. 2011. Retrieved from http://www.arhp.org/Publications-and-Resources/Quick-Reference-Guide-for-Clinicians/choosing/IUC

Berenson AB, Rahman M. Changes in weight, total fat, percent body fat, and central-to-peripheral fat ration associated with injectable and oral contraceptive use. American Journal of Obstetrics and Gynecology. 2009; 200(329):e1-329–e1-8. [PubMed: 19254592]

Bonny AE, Secic M, Cromer B. Early weight gain related to later weight gain in adolescents on depot medroxyprogesteron acetate. Obstetrics & Gynecology. 2011; 117:793–797. [PubMed: 21422849]

Brunner Huber LR, Hogue CJ. The association between body weight, unintended pregnancy resulting in a livebirth, and contraception at the time of conception. Maternal & Child Health Journal. 2005; 9(4):413–420. [PubMed: 16235025]

Brunner Huber LR, Hogue CJ, Stein AD, Drews C, Zieman M. Body mass index and risk for oral contraceptive failure: A case-cohort study in South Carolina. Annals of Epidemiology. 2006; 16(8): 637–643. [PubMed: 16516489]

Carmina E. Cardiovascular risk and events in polycystic ovary syndrome. Climacteric. 2009; 12(1):22–25. [PubMed: 19811236]

Centers for Disease Control and Prevention. CDC. Adult obesity facts. 2011. Retrieved from http://www.cdc.gov/obesity/data/adult.html

Centers for Disease Control and Prevention. U.S. Medical Eligibility Criteria for Contraceptive Use, 2010, adapted from the World Health Organization Medical Eligibility Criteria for Contraceptive Use, 4th ed. MMWR. 2010; 59(RR-#4):1–85.

Centers for Disease Control and Prevention. Contraception. 2012. Retrieved from http://www.cdc.gov/reproductivehealth/UnintendedPregnancy/Contraception.htm

Cochrane RA, Gebbie AE, Loudon JC. Contraception in older women. Maturitas. 2011; 71:240–247. [PubMed: 22240491]

Cochrane RA, Gebbie AE, Loudon JC. Contraception in obese older women. Maturitas. 2012; 71:240–247. [PubMed: 22240491]

Cole JA, Norman H, Doherty M, Walker AM. Venous thromboembolism, myocardial infarction, and stroke among transdermal contraceptive system users. Obstetrics & Gynecology. 2007; 109:339–346. [PubMed: 17267834]

Curtis KM. U.S. Medical Eligibility Criteria for Contraceptive Use, 2010: Adapted from the World Health Organization Medical Eligibility Criteria for Contraceptive Use, 4th ed. MMWR. 2010; 59:1–88.

Curtis KM, Martins SL. Progestogen-only contraception and bone mineral density: A systematic review. Contraception. 2006; 73:470–487. [PubMed: 16627031]

Curtis KM, Tepper NK, Marchbanks PA. Putting risk into perspective: The US medical eligibility for contraceptive use. Reviews in Endocrine & Metabolic Disorders. 2011; 12:119–125. [PubMed: 21541854]

Devine KS. The underutilization of emergency contraception. American Journal of Nursing. 2012; 112(4):44–50. [PubMed: 22421320]

Dinger JC, Cronin M, Möhner S, Schellschmidt I, Minh TD, Westhoff C. Oral contraceptive effectiveness according to body mass index, weight, age, and other factors. American Journal of Obstetrics and Gynecology. 2009; 201(263):e1–e9. [PubMed: 19481720]

Edelman AB, Carlson NE, Cherala G, Munar MR, Stouffer RL, Cameron JL, Stanszyk FZ, Jensen JT. Impact of obesity on oral contraceptive pharmacokinetics and hypothalamic-pituitary-ovarian activity. Contraception. 2009; 80:119–127. [PubMed: 19631786]

Elkind-Hirsch KE, Darensbourg C, Ogden B, Ogden LF, Hindelang P. Contraceptive vaginal ring use for women has less adverse metabolic effects than an oral contraceptive. Contraception. 2007; 76:348–356. [PubMed: 17963858]

Finer LB, Henshaw SK. Disparities in rates of unintended pregnancy in the United States, 1994 and 2001. Perspectives in Sexual and Reproductive Health. 2006; 38(2):90–96.

Freeman S, Shulman LP. Considerations for the use of progestin-only contraceptives. Journal of the American Academy of Nurse Practitioners. 2010; 22:81–91. [PubMed: 20132366]

Gallo MF, Grimes DA, Schulz KF, Helmerhorst FM. Combination estrogen-progestin contraceptives and body weight: Systematic review of randomized controlled trials. Obstetrics & Gynecology. 2004; 103:359–373. [PubMed: 14754709]

Gidiri MF, Greer IA. Bariatric surgery in pregnancy: Benefits, risks, and obstetrical management. Fetal and Maternal Medicine. 2011; 22:109–122.

Gordon L, Thakur N, Atlas M, Januchowski R. Clinical inquiries. What hormonal contraception is most effective for obese women? Journal of Family Practice. 2007; 56(6):471–473. [PubMed: 17543258]

Grimes DA, Shields WC. Family planning for obese women: Challenges and opportunities. Contraception. 2005; 72(1):1–4. [PubMed: 15964284]

Guttmacher Institute. Unintended pregnancy in the United States. 2012. Retrieved from http://www.guttmacher.org/pubs/FB-Unintended-Pregnancy-US.pdf

Hassan DF, Petta CA, Aldrighi JM, Bahamondes L, Perrotti M. Weight variation in a cohort of women using copper IUD for contraception. Contraception. 2003; 68(1):27–30. [PubMed: 12878283]

Heinig MJ, Nommsen-Rivers LA, Peerson JM, Dewey KG. Factors related to duration of postpartum amenorrhoea among USA women with prolonged lactation. Journal of Biosocial Science. 1994; 26(4):517–527. [PubMed: 7983102]

Hight-Laukaran V, Labbok MH, Peterson AE, Fletcher V, von Hertzen H, Van Look PFA. Multicenter study of the Lactational Amenorrhea Method (LAM): II. Acceptability, utility, and policy implications. Contraception. 1997; 55(6):337–346. [PubMed: 9262928]

Holt VL, Scholes D, Wicklund KG, Cushing-Haugen KL, Daling JR. Body mass index, weight and risk of oral contraceptive failure risk. Obstetrics & Gynecology. 2005; 105:46–52. [PubMed: 15625141]

Jamieson DJ, Hillis SD, Duerr A, Marchbanks PA, Costello C, Peterson HB. Complications of interval laparoscopic tubal sterilization: Findings from the United States Collaborative Review of Sterilization. Obstetrics & Gynecology. 2000; 96(6):997–1002. [PubMed: 11084192]

Jennings CL, Lambert EV, Collins M, Joffe Y, Levitt NS, Goedecke JH. Determinants of insulin-resistant phenotypes in normal-weight and obese Black African women. Obesity. 2008; 16(7): 1602–1609. [PubMed: 18421268]

Kaneshiro B, Edelman A. Contraceptive considerations in overweight teens. Current Opinions in Obstetrics & Gynecology. 2011; 23:344–349.

Kaneshiro B, Edelman A, Carlson N, Nichols M, Jensen J. The relationship between body mass index and unintended pregnancy: Results from the 2002 National Survey of Family Growth. Contraception. 2008; 77(4):234–238. [PubMed: 18342645]

Kaunitz AM, Grimes DA. Removing the black box warning for depot medroxyprogesterone acetate. Contraception. 2011; 84:212–213. [PubMed: 21843682]

Keller C, Larkey L, Distefano JK, Boehm-Smith E, Records K, Robillard A, Veres S, Al-Zadjali M, O'Brian AM. Perimenopausal obesity. Journal of Women's Health. 2010; 19(5):987–996.

Lidegaard Ø, Løkkegaard E, Svendsen AL, Agger C. Hormonal contraception and risk of venous thromboembolism: National follow-up study. British Medical Journal. 2009; 339:b2890. [PubMed: 19679613]

Lindberg CE. Emergency contraception: The nurse's role in providing postcoital options. Journal of Obstetrical, Gynecologic, & Neonatal Nursing. 1997; 26(2):145–152.

Lopez LM, Grimes DA, Chen-Mok M, Westhoff C, Edelman A, Helmerhorst FM. Hormonal contraceptives for contraception in overweight or obese women. Cochrane Database of Systematic Reviews. 2010; 7(7) Art. No. CD008452. doi: 10.1002/14651858.CD008452.p.

Lopez LM, Grimes DA, Gallo MF, Schultz KF. Skin patch and vaginal ring versus combined oral contraceptives for contraception. Cochrane Database of Systematic Reviews. 2008; (Issue 1) Art. No.: CD003552. doi: 10.1002/14651858.CD003552.pub2.

Lunn PG. Lactation and other metabolic loads affecting human reproduction. Annals of the New York Academy of Sciences. 1994; 709(1):77–85. [PubMed: 8154736]

Mansour D. Implications of the growing obesity epidemic on contraception and reproductive health. Journal of Family Planning and Reproductive Health Care. 2004; 30(4):209–211. [PubMed: 15530216]

McNeilly AS, Tay CCK, Glasier A. Physiological mechanisms underlying lactational amenorrhea. Annals of the New York Academy of Sciences. 1994; 709(1):145–155. [PubMed: 8154698]

Merck. Implanon-USA Prescribing information. 2012. Retrieved from http://www.implanon-usa.com/en/consumer/index.asp

Mornar S, Chan L, Mistretta S, Neustadt A, Martins S, Gilliam M. Pharmacokinetics of the etonogestrel contraceptive implant in obese women. American Journal of Obstetrics & Gynecology. 2012; 207(2):110e1–110e6. [PubMed: 22717269]

Mosher WD, Martinez GM, Chandra A, Abma JC, Wilson SJ. Use of contraception and use of family planning services in the United States: 1982–2002. Advance Data. 2004; 350:1–36. [PubMed: 15633582]

Murthy AS. Obesity and contraception: Emerging issues. Seminars in Reproductive Medicine. 2010; 28(2):156–163. [PubMed: 20352564]

National Guideline Clearinghouse. Male and female condoms. 2008. Retrieved from http://www.guideline.gov/content.aspx?id=12221

Ogden, CL.; Carroll, MD.; McDowell, MA.; Flegal, KM. Obesity among adults in the United States—No change since 2003–2004. National Center for Health Statistics; Hyattsville, MD: 2007. NCHS data brief no. 1

Organon (a Merck subsidiary). Prescribing information: IMPLANON™ (etonogestrel implant) 68 mg for subdermal use only. 2008. Retrieved from http://www.accessdata.fda.gov/drugsatfda_docs/label/2009/021529s004lbl.pdf

Organon (a Merck subsidiary). Highlights of prescribing information: IMPLANON™ (etonorgestrel implant 68 mg for subdermal use only. 2011. Retrieved from http://www.accessdata.fda.gov/drugsatfda_docs/label/2009/021529s007lbl.pdf

Patel JA, Colella JJ, Esaka E, Patel NA, Thomas RL. Improvement in infertility and pregnancy outcomes after weight loss surgery. Medical Clinics of North America. 2007; 91(3):515–528. [PubMed: 17509393]

Pelosi M, Pelosi M. Pelosi minilaparotomy hysterectomy: A non-endoscopic minimally invasive alternative to laparoscopy and laparotomy. Surgical Technology International. 2004; 13:157–167. [PubMed: 15744686]

Peterson AE, Peŕez-Escamilla R, Labbock MH, Hight V, von Hertzen H, Van Look P. Multicenter study of the lactational amenorrhea method (LAM) III: Effectiveness, duration, and satisfaction with reduced client–provider contact. Contraception. 2000; 62(5):221–230. [PubMed: 11172792]

Pfizer. Depo-subQ provera 104™ physician information. 2009. Retrieved from http://www.accessdata.fda.gov/drugsatfda_docs/label/2009/021583s011lbl.pdf

Pfizer. Full prescribing information: DEPO-PROVERA CI. 2010. Retrieved from http://www.accessdata.fda.gov/drugsatfda_docs/label/2010/020246-s036lbl.pdf

Richman S. Obesity and time to conception. Contraception. 2008; 78:13.

Rodriguez MI, Edelman AB. Safety and efficacy of contraception: Why should the obese woman be any different. Review of Endocrine & Metabolic Disorders. 2011; 12:85–91.

Schraudenbach A, McFall S. Contraceptive use and contraception type in women by body mass index category. Women's Health Issues. 2009; 19:381–389. [PubMed: 19879452]

Trussell J. Contraceptive failure in the United States. Contraception. 2011; 83:397–404. [PubMed: 21477680]

Trussell J, Guthrie KA, Schwarz EB. Much ado about little: Obesity, combined hormonal contraceptive use, and venous thrombosis. Contraception. 2008; 77(3):143–146. [PubMed: 18279682]

Trussell J, Schwarz EB, Guthrie K. Obesity and oral contraceptive pill failure. Contraception. 2009; 79(5):334–338. [PubMed: 19341843]

Valeggia CR, Ellison PT. Interactions between metabolic and reproductive functions in the resumption of postpartum fecundity. American Journal of Human Biology. 2009; 21(4):559–66. [PubMed: 19298003]

van den Heuvel MW, van Bragt AJ, Alnabawy AK, Kaptein MC. Comparison of ethinylestradiol pharmacokinetics in three hormonal contraceptive formulations: The vaginal ring, the transdermal patch and an oral contraceptive. Contraception. 2005; 72(3):168–174. [PubMed: 16102549]

Van der Wijden C, Brown J, Kleijnen J. Lactational amenorrhea for family planning. Cochrane Database of Systematic Reviews. 2003; 2003(4):1–20. doi:10.1002/14651858.cd001329.

van Hylckama Vlieg A, Helmerhorst FM, Vandenbroucke JP, Doggen CJM, Rosendaal FR. The venous thrombotic risk of oral contraceptives, effects of oestrogen dose and progestogen type: Results of the MEGA case-control study. British Medical Journal. 2009; 339:b2921. [PubMed: 19679614]

Vandenbroucke JP, Rosing J, Bloemenkamp KW, Middeldorp S, Helmerhorst FM, Bouma BN, Rosendaal FR. Oral contraceptives and the risk of venous thrombosis. New England Journal of Medicine. 2001; 344(20):1527–1535. [PubMed: 11357157]

Viola AS, Castro S, Bahamondes MV, Fernandes A, Viola CFM, Bahamondes L. A cross-section of the forearm bone mineral density in long-term current users of the injectable contraceptive depot medroxyprogesterone acetate. Contraception. 2011; 84:e31–e37. doi:10.1016/j.contracepton.2011.06.012. [PubMed: 22018135]

Weisberg E. Contraceptive options for women in selected circumstances. Best Practice & Research Clinical Obstetrics and Gynaecology. 2010; 24:593–604. [PubMed: 20434405]

World Health Organization. WHO statement on hormonal contraception and bone health. Weekly Epidemiological Record. 2005; 35:302–304. Retrieved from http://whqlibdoc.who.int/wer/WHO_WER_2005/80_297–304(no35).pdf.

Wuntakal R, Hollingworth T. The implications of obesity on pregnancy. Obstetrics, Gynecology, and Reproductive Medicine. 2009; 19(12):344–359.

Yranski PA, Gamache ME. New options for barrier contraception. JOGGN. 2008; 37:384–389.

Table 1

Contraception available to U.S. women

Types of BC	Impact of method on obesity	Safety concerns R/T obesity	Impact of obesity on method	How available	Efficacy (% women pregnant with use)	Teaching needed for proper use
COC	Minimal	Possible; depends on patient	May be less effective with lower dose	Rx	P: 0.3% T: 8%	Daily use
POP	None	None	None with proper use	Rx	P: 0.3% T: 8%	Daily use
IUD	None	None	Maybe more difficult to insert	Rx, plus insertion in office	P: 0.6% (copper) P: 0.2% (LNG) T: same for both	Monthly string check
Implant	Minimal	Minimal	Minimal	Rx, plus insertion in office	P: 0.05% T: 0.05%	None
CVR	Minimal	Possible; depends on patient	May be more difficult to use	Rx	P: 0.3% T: 8%	Insert 1 each 3 weeks, remove for 1 week
Patch	Minimal	Possible; depends on patient	May be less effective	Rx	P: 0.3% T: 8%	Place 1 each week ×3 weeks
DMPA	May cause wt. gain	None	None with proper dosing	Rx, with 12 week injection schedule	P: 0.3% T: 3%	None
LAM	None	None	May be less effective	No Rx needed	Not applicable[a]	Needs intensive teaching
Diaphragm FemCap	None	None	May be more difficult to fit and insert correctly	Rx with fitting in office	P: 6% T: 16%	Use with each coitus, cleaning and storage
Lea's shield Sponge	None	None	May be more difficult to use correctly	OTC	P: 20% (parous) P: 9% (nullip) T: 32% (parous) T: 16% (nullip)	Use with each coitus
Condoms	None	None	Female condom may be more difficult to use correctly	OTC	P: 5% (female) T: 21% (female) P: 2% (male) T: 15% (male)	Use with each coitus, proper wearing
EC (Plan B)	None	None	None	OTC, may be behind counter In surgery suite	Not applicable	Take ASAP
Sterilization	None	Maybe more difficult to achieve sterilization	If sterilization achieved, no impact	In surgery suite	P: 0.5% T: 0.5%	None after consent

CDC (2010).

[a]Effectiveness varies by study, with cumulative life table pregnancy rates between 0.45 and 2.45 for those following LAM criteria in controlled studies (Van der Wiiden, Brown, & Kleiinen, 2003).