

## CONTRACEPTION

A variety of contraceptive modalities are available. The least reliable methods of contraception include palliation, withdrawal, and barrier. The likelihood of conception in any given cycle of unprotected coitus is described at approximately 20% to 22%. No contraception will yield on a monthly basis this overall risk of conception. A patient employing the withdrawal method with or without evaluation of her cycle rhythm is extremely likely to conceive at the same rate. Seminal fluid leaking prior to ejaculation contains sperm, so withdrawal and rhythm are unreliable methods at best. Barrier methods are divided into diaphragm and condom. The ever-present likelihood that a condom can break is discussed. The spermicide in the condom may be insufficient to prevent sperm from penetrating the cervical mucous and ultimately leading to fertilization of an oocyte. Diaphragm requires preparation for coitus as well as the concomitant use of a spermicide. The diaphragm must be positioned appropriately and left in place for at least 12 hours after the coital event. The unreliability of patients correctly using diaphragm on every coital event is well known and is the prime reason this method is often unreliable.

Oral contraceptives are the most commonly used contraceptive method in young women. Progesterone-only pills and mixed estrogen/progesterone pills are available in this country. The example of progesterone-only pill is Micronor. Micronor finds its best use in a woman who is presently lactating after delivery. Progesterone alone does not act to stabilize the lining of the uterus, so women using Micronor or "mini-pills" for contraception likely have irregular vaginal spotting. Continuous use of Micronor is not as likely as mixed estrogen/progesterone pills to prevent pregnancy either. Mixed estrogen/progesterone pills were developed in the late 1960s. Initial dose of birth control was 90 mcg of estrogen per pill. By the 70s, the dose had decreased to 50 mcg and by the 80s the dose had decreased to 30 or 35 mcg per pill. Presently, ultra-low-dose pills are available in the 20 to 25 mcg range. The stated efficacy of birth control pills has not decreased as a consequence of lowering the dose of estrogen; however, the increased prevalence of obesity and morbid obesity in the population suggest that perhaps as the volume of distribution increases that the ultra-low-dose pills may not be ideal for every patient or similarly efficacious for every patient. Specific data on this topic still is lacking.

Duration of therapy in any given cycle is now variable amongst pill manufacturers. Initially, pills were packaged of 21 active pills on a month with seven placebos. Pills have now been increased to 25 active pills on a 28-day cycle and to 90-day cycle packs. It is not essential to bleed on a monthly basis and the initial use of a monthly bleed, if anything, was an attempt on the part of the initial formulators of birth control to make it seem "natural" by mirroring the natural female cycles. Because estrogen/progesterone suppresses ovulation there is no reason that a patient needs to bleed on a monthly basis, and newer formulations are designed and marketed to give woman the option to bleed on a less regular basis.

Mixed estrogen/progesterone vaginal contraceptive is available. NuvaRing is to be changed on a monthly basis. If the NuvaRing comes out it needs to be washed and reinserted. If the NuvaRing is out for more than two hours, alternative contraceptive is recommended. The NuvaRing may be used either on a 21-day basis with removal for seven days and reinsertion on the eighth day or on a continuous 30- or 31-day basis with withdrawal bleeds scheduled by the patient.

Mixed estrogen/progesterone patch is available. Ortho Evra is a weekly patch to be applied on a weekly basis for three consecutive weeks. A fourth week is patch free. The cycle is then repeated monthly. It is also possible to use patches continuously and schedule periodic withdrawal bleeds based on patient's schedule and priorities.

Intrauterine devices are next discussed. Two principal intrauterine devices are available in the United States i.e. the copper IUD and the progesterone IUD. The copper IUD is the oldest of the two. Often women with a copper IUD are counseled that dysmenorrhea may increase, the duration of flow may increase, and the volume of bleeding may increase in any given cycles as a consequence of the IUD being on board. The progesterone-impregnated IUD likely decreases the number of the days of flow, decreases dysmenorrhea, and may also decrease the volume of blood lost in any given cycle.

Progesterone-only injection/Depo Provera is another option. This option is fairly convenient for people who have difficulty using a pill on a daily basis. Depo Provera, however, brings the unwanted side effect of irregular bleeding and of water weight gain and bloating. Depo Provera has a longest half-life of all the contraceptives and return to regular normal cycling after cessation of Depo Provera use may stretch to six to nine months.

The subcutaneous implantable device Implanon is available as well. Implanon is a progesterone-only contraceptive just as was Norplant. The Implanon device is available. The downside of the Implanon is that it is difficult to insert compared to taking birth control pills and requires surgical removal as well. The convenience of Implanon must be contrasted against its benefits.

Return to fertility following use of reversible contraception is also a consideration. A woman's long term ability to conceive is not affected directly by use of reversible contraceptives. Acquiring tubal disease through infection or peritonitis from other disease process is independent of contraceptive choice. Data from W Bagwell, 1995, and H Belhadj, 1986, are used. Median time to conception after discontinuation of oral contraceptive pills is 3 – 6 months, Depo Provera is 10 months, Copper IUD is three months and Mirena IUD is 4 months. No data is available on OrthoEvra patches, NuvaRing or Implanon.

The final category of contraception is sterilization and/or definitive surgery/hysterectomy. Tubal sterilization according to the CREST data has a failure rate of approximately 15 per 1000 procedures. This is essentially the failure rate of copper IUD and higher than the 5 per 1000 failure rate of Mirena/progesterone-impregnated IUD. Tubal sterilization is convenient in the most widely used method of sterilization in woman with children in the United States. Sterilization, however, should be understood as an irreversible technique because even with laparotomy and microsurgical repair only approximately 50% of woman will have successful conception thereafter. Woman with diminished fecundability prior to sterilization are even less likely to conceive after a restorative tubal microsurgery.

Hysterectomy particularly laparoscopic supracervical hysterectomy may benefit the patient in terms of cessation of flow and cessation of secondary dysmenorrhea symptoms. This leaves a woman irrevocably sterile as well.

Additional information on contraception is available from various lay sources including WebMD and the DWC website.