

CONTRACEPTION

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A. Contraception Overview:

Almost 50% of pregnancies in the U.S. in 1994 were unintended. Of the couples who became pregnant half had been using birth control in the month they conceived.

Contraceptive choice varies by age group and pregnancy risk with oral contraceptives being most popular from ages 15-29 but sterilization most popular from age 30-44. Contraceptive choice changed somewhat in the late 80's and early 90's with condom use increasing in the 15-29 year old age group because of fear of AIDS and STD's. Oral contraceptive use decreased in popularity in the 15-29 year old age group probably because of competition from the implant and the injectable.

Adolescent pregnancy is a tremendous social, educational, and economic problem. 70% of adolescents have had sex prior to the age of 19 and only half used any protection at the time of their first coitus.

B. Typical Failure Rate by Method

The percentage of women experiencing accidental pregnancy within the first year of use for the various methods follows:

Percentage of women experiencing pregnancy in the first year of typical use¹

Method	Failure Rate (%)	Method	Failure Rate (%)
Chance	85	Pill	5
Spermicides	26	IUD	0.1-2.0
Periodic abstinence	25	Depo-Provera	0.3
Withdrawal	19	Norplant	0.05
Cap		BTL	0.5
Parous	40	Vasectomy	0.15
Nulliparous	20		
Diaphragm	20		
Condom	14		

It is noteworthy that implants, injectables, sterilization and for the most part, IUD's leave little room for user error. However, in the adolescent population, at least 4 out of 100

¹ *Contraceptive Technology, 17th edition.* 1998, p. 216.

under the age of 22 using oral contraceptives will become pregnant during the first year of use.

Emergency Contraceptive Pills if taken within 72 hours of intercourse reduce the risk of pregnancy by 75-80%.

C. Risks of Contraceptive Methods

The risk of death from a contraceptive method is extraordinarily low for most women and usually not as great as the risk of death from pregnancy-related complications. The following table helps keep voluntary risks in perspective:

Voluntary Risks²

Activity	Chance of Death in a Year
Risks for Men and Women of All Ages Who Participate In:	
Motorcycling	1 in 1,000
Automobile Driving	1 in 5,900
Power Boating	1 in 5,900
Rock Climbing	1 in 7,200
Playing Football	1 in 25,000
Canoeing	1 in 100,000
Risks for Women Aged 15-44 years	
Using Tampons	1 in 350,000
Having Sexual Intercourse (PID)	1 in 50,000
Preventing Pregnancy	
Using Oral Contraceptives	
Nonsmoker	1 in 66,700
Heavy Smoker (25 or more cigarettes per day)	1 in 1,700
Age < 35	1 in 5,300
Age 35-44	1 in 700
Using IUD's	1 in 10,000,000
Using Diaphragm, Condom, or Spermicide	None
Undergoing Sterilization	
Laparoscopic Tubal Ligation	1 in 38,500
Hysterectomy	1 in 1,600
Vasectomy	1 in 1,000,000

² *Contraceptive Technology, 17th edition.* 1998, p. 230.

Terminating Pregnancy	
Legal Abortion	
Before 9 weeks	1 in 262,800
Between 9-12 weeks	1 in 100,100
Between 13-15 weeks	1 in 34,400
After 15 weeks	1 in 10,200
Continuing the Pregnancy	1 in 10,000

D. Cost of Contraception

The economic implications of contraception are significant. For those with no insurance or no access to low cost health care, the cost of the office visit for the required Pap and pelvic examination for prescription of a birth control method may be prohibitive. Additionally, even for those individuals with health insurance, the cost of certain types of contraception is not covered. Increasingly, because of political pressures, third party payers are beginning to cover the cost of contraception, including oral contraceptives.

Cost of Contraception In Dollars³

Method	Start-Up Cost ⁴	Annual Cost
IUD	300-400	
Diaphragm	60	\$ 85
OC's	60	250
DepoProvera	70	200
Spermicides		85
Condom		50
Abstinence		

E. Condoms

- Latex or polyurethane sheaths that fit over the penis and prevent transmission of semen into the vagina; act as a mechanical barrier to sperm, bacteria and viruses; nonoxynol-9 spermicide, if present, kills sperm, but recent studies show nonoxynol-9 to be associated with an increased risk of urinary tract infection in women.
Furthermore, frequent use of N-9 spermicides have been associated with genital lesions which may increase the risk of HIV transmission.⁵
- Huge variety (straight-sided or tapered, ribbed or smooth, lubricated or non-lubricated, colored or clear, spermicidal or not, latex or polyurethane or natural

³ *Contraceptive Technology, 17th edition.* 1998. P. 239.

⁴ Managed care setting

⁵ CDC, Sexually Transmitted Diseases Treatment Guidelines, 2002. MMWR Weekly Report, 2002;51; RR-6

membrane (latter may permit passage of viruses, including hepatitis B, herpes simplex and HIV)

- Latex may cause allergy especially with continued use
- 2-14% failure rate....vaseline or mineral oil can markedly decrease the strength of the condom within seconds; use only water-based lubricants such as K-Y jelly
- Failure is usually due to incorrect or inconsistent use not breakage.
- Cheap, accessible, decrease sexually transmitted disease
- Store in a cool, dry, dark place (keeps in a wallet for up to a month)
- If the condom tears or slips, immediately insert spermicidal foam, cream or gel into the vagina and contact health care provider for emergency contraception (must be taken within 72 hrs of unprotected intercourse)
- Condom use has increased over the past decade but condoms are only used by approximately half of sexually active adolescents.
- Unfortunately, most adolescents perceive condoms as a *contraceptive* rather than a means of *preventing STD's*
- A meta analysis of 25 studies showed heterosexual transmission rate for HIV of .9 per 100 person-years for couples serodiscordant for HIV who consistently used condoms.

F. Female Condom

- Over-the-counter, one size fits all, polyurethane sheath with 2 flexible polyurethane rings closed at one end
- Stronger than latex male condom
- Silicone based lubricant inside sheath is not spermicidal
- 21% failure rate; under female control
- Acts as mechanical barrier to sperm
- Cannot use with male condom
- Provides some vulvar protection against STD's
- May be more difficult to use than male condom; unpleasant noises
- In the efficacy study for FDA approval, almost half of the couples indicated they liked the female condom and would recommend it to friends

G. Vaginal Spermicide

- Most vaginal spermicides contain nonoxynol-9 which is a surfactant which destroys sperm membranes
- Simple, safe, available without a prescription
- 26% failure rate; under female control
- Available as foam, cream, jelly, suppository, film, or tablet
- With spermicidal foam, the container must be shaken vigorously to disperse the spermicide before use.
- Spermicidal tablets or suppositories need 10-15 minutes to dissolve.
- Additional spermicide must be used each time intercourse is repeated; if more than an hour has elapsed between application and planned intercourse, reinsert.

- Do not douche for at least 6-8 hours after intercourse (douching is not necessary nor advised)
- **Nonoxynol-9 is not effective in preventing transmission of STD.**
- **Latex is only barrier method that can effectively protect against HIV.**

H. Diaphragm

- Dome-shaped rubber cup with a flexible rim that holds spermicidal cream near the cervical os
- A candidate must have good vaginal tone, have a “shelf” behind the symphysis pubis, and be able to feel her own cervix (or have an involved partner).
- Women should be refitted after pregnancy due to changes in anatomy or after weight gain of 10 lbs or more.
- Diaphragms come in a range of sizes (the numbers correspond to the rim diameter in millimeters)
- Must be placed in the vagina prior to intercourse
- Must be used with spermicidal jelly or cream
- Cervix must be covered by the dome of the diaphragm
- If the diaphragm is placed > 2 hours before intercourse, use another application of spermicide (do not remove diaphragm)
- Leave in place at least 6 hours after intercourse
- If more than one act of coitus within 6 hours, use another application of spermicide
- Increases the risk of UTI in some users

J. IUD's

- IUD use in the USA experienced a marked decrease in the 1970's due to publicity about complications; in 1995, less than 1% of women at risk of pregnancy were using the IUD
- Three IUD's are currently available in the USA .
 - Cu T380A (ParaGuard); T shaped; effective for 10 years
 - Progesterone T (Progestasert) IUD's are available in the United States; T shaped; effective for 1 year
 - Levonorgestrel containing IUD (Mirena) effective for 5 years
- Contraindicated in patients with hx of tubal pregnancy, copper allergy, abnormal vaginal bleeding, severe menstrual pain
- Must be inserted by a health professional knowledgeable and experienced in insertion
- Mechanism of action includes inflammatory changes which immobilize sperm and interfere with migration of sperm to the fallopian tubes
- Candidate should be parous, at low risk for PID, and in a mutually monogamous relationship; the risk of PID greatly increases if the IUD bearer is exposed to an STD which can cause PID
- Risk of PID is greatest in the first few weeks following insertion.
- Contraindicated in someone with HIV, known or suspected pregnancy

- Check for string after menses to assure that IUD is still in place
- Health care professional can tell what type of IUD is in place by inspecting the color of the string
- Could avoid surgical procedure for women wanting sterilization

Components of IUD's:

- **Cu T380 A**
 1. Polyethelene impregnated with Barium Sulfate for x-ray visibility
 2. Copper wire is wrapped around the vertical stem; each arm is wrapped in a copper sleeve.
 3. Clear-white monofilament polyethylene string.
 4. Lasts 10 years; 90% of IUD users in North America use this IUD
 5. Failure rate in a typical user is only 0.8%
 6. May increase bleeding and cramping with menses
 7. Can be used in women who cannot use hormonal methods
- **Progesterone T**
 1. Ethylene vinyl acetate copolymer impregnated with Barium Sulfate
 2. 38 mg reservoir of progesterone which releases 65 mcg of progesterone per day
 3. Blue-black monofilament string
 4. Lasts 1 year
 5. Failure rate in a typical user is 2.0%
 6. Relatively decreases menstrual blood loss and dysmenorrhea
 7. If the woman becomes pregnant with this IUD in place, her risk of ectopic is increased. About 5% of women pregnant with an IUD in place will have an ectopic. Progestasert users have a 6-10x higher rate of ectopics than do copper IUD users.
- **Levonorgestrel containing IUD**
 1. 32 mm x 32 mm T-shaped polyethylene-barium sulfate fram with a reservoir around the vertical stem that contains silicone and 52 mg of levonorgestrel; two threads for removal are attached to the stem
 2. Release rate of levonorgestrel is 20 micrograms/day gradually decreasing to 10 micrograms/day after 5 years. After the first few weeks, plasma concentrations become stable at 150-200 pg/ml, lower than those with Norplant or OCs.
 3. Thickens cervical mucus, inhibits sperm capacitation or survival, changes the endometrium
 4. 80% of women desiring pregnancy become pregnant within 1 year of removal of the device
 5. One-year failure rate 0.1%

6. Adverse effects: first 3-6 months, spotting and bleeding are more frequent; after 6 months, bleeding decreases and 20% of women have amenorrhea. Progestin related side-effects include functional ovarian cysts, acne, back pain, breast tenderness, Has, mood changes and nausea. Like other IUDs, can become imbedded in the myometrium, can perforate the uterus or cervix (usually during insertion), if IUP occurs while in place, may increase the risk of miscarriage, sepsis, premature labor and premature delivery.
7. Costs \$500 plus cost of insertion. (5 yr cost of OCs=\$1800)

K. Sterilization

- Most popular method of contraception worldwide
- Vasectomy is the medically preferred procedure if both bilateral tubal ligation (BTL) and vasectomy are acceptable to the couple.
- BTL: ligation, cautery or clipping of fallopian tubes
 1. Failure rate is 0.5% usually because of pregnancy at the time of sterilization, surgical error or reanastomosis
 2. Mortality rate is 1:38,500 from complications of general anesthesia, infection or hemorrhage
 3. Reversibility ranges from 40-75% and requires the skills of a microsurgeon
- Vasectomy: cautery of the vas deferens
 1. Failure rate is 0.15% usually due to unprotected coitus before the reproductive tract is cleared of sperm or from recanalization of the ducts.
 2. Complications of the procedure include hematomas, infection or granulomas which are collections of sperm, epithelial cells and lymphocytes at the surgical site. Approximately 60-75% of men develop sperm antibodies but there appears to be no pathologic sequelae to this.
 3. Reversibility is usually >50% and requires the skills of a microsurgeon
 4. As vasectomy rates increase, so have prostate cancer mortality rates. Several large studies have attempted to determine if there is a relationship. If such a relationship exists, it is quite weak and the NIH has made the following recommendations:
 - Providers should continue to perform vasectomies.
 - Vasectomy reversal is not warranted to prevent prostate cancer.
 - Screening for prostate cancer should not be any different for men who have had a vasectomy than for those who have not.⁶

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