CONTRACEPTION
Contraception

Contraception generally implies the prevention of pregnancy following sexual intercourse by:

• Inhibiting viable sperm from coming into contact with a mature ovum (barriers)

• prevent ovulation

• preventing a fertilized ovum from implanting successfully in the endometrium (create an unfavorable uterine environment)
Menstrual cycle

• Begins with menarche, around age 12 yrs, continues until menopause, around age 50 yrs.

• The cycle includes the vaginal discharge of sloughed endometrium called *menses* or *menstrual flow*.

• Three phases:
  - follicular (or preovulatory)
  - ovulatory,
  - luteal (or postovulatory)
Menstrual cycle

• The first day of menses is referred to as *day 1 of the menstrual cycle* and marks the beginning of the follicular phase.

• The follicular phase continues until ovulation, which typically occurs on day 14.

• The time after ovulation is referred to as the *luteal phase*, which lasts until the beginning of the next menstrual cycle.

• The median menstrual cycle length is 28 days, but it can range from 21 to 40 days.
Follicular Phase

• In the first 4 days, FSH levels rise and allow the recruitment of a small group of follicles for continued growth and development.

• Between days 5 and 7, one follicle becomes dominant.

• The dominant follicle develops increasing amounts of estradiol and inhibin, which cause a negative feedback on secretion of GnRH and FSH, causing atresia of the remaining follicles.

• Estradiol serves to stop the menstrual flow from the previous cycle, thickening the endometrial lining of the uterus to prepare it for embryonic implantation.

• Estrogen is responsible for increased production of thin, watery cervical mucus, which will enhance sperm transport during fertilization.
**Ovulation**

- When estradiol levels remain elevated for a sustained period of time (200 pg for at least 50 hours), the pituitary releases a midcycle LH surge.

- On average, ovulation occurs 24 to 36 hours after the estradiol peak and 10 to 16 hours after the LH peak.

- After ovulation, the oocyte is released and travels to the fallopian tube, where it can be fertilized and transported to the uterus for embryonic implantation.

- Conception is most successful when intercourse takes place from 2 days before ovulation to the day of ovulation.
Luteal Phase

• The remaining luteinized follicles become the corpus luteum, which synthesizes androgen, estrogen, and progesterone

• Progesterone helps to maintain the endometrial lining, which sustains the implanted embryo and maintains the pregnancy

• If pregnancy occurs, hCG prevents regression of the corpus luteum

• stimulates continued production of estrogen and progesterone secretion to maintain the pregnancy until the placenta is able to fulfill this role (usually 6–8 weeks’ gestation)
Luteal Phase

• If fertilization or implantation does not occur, the corpus luteum degenerates, and progesterone production declines

• As progesterone levels decline, endometrial shedding (menstruation) occurs, and a new menstrual cycle begins

• At the end of the luteal phase, when estrogen and progesterone levels are low, FSH levels start to rise, and follicular recruitment for the next cycle begins
• American College of Obstetrics and Gynecology (ACOG) and other national organizations allow provision of hormonal contraception after a simple medical history (diabetes, liver disease) and blood pressure measurement

• pelvic and breast examinations, screening for cervical neoplasia, and counseling for prevention of STDs, can be accomplished during routine annual office visits
Nonpharmacologic Therapy

Periodic Abstinence

- avoiding sexual intercourse during the days of the menstrual cycle when conception is likely to occur

- These women rely on physiologic changes, such as basal body temperature and cervical mucus, during each cycle to determine the fertile period

- Relatively high pregnancy rates among users and the need to avoid intercourse for several days during each menstrual cycle

- To overcome these drawbacks, many women use barrier methods or spermicides during the fertile period
Standard day method

• appropriate for women whose menstrual cycles are usually between 26 and 32 days long

• avoid from day 8 of the cycle through day 19

• pregnancy rate of <5 per 100 women per year with correct use
Ovulation method

• Requires women to observe and evaluate their cervical secretions several times each day, record, interpret

• Avoid unprotected intercourse on the days with fertile secretions, plus the additional days required by method rules for a total of approximately 17 days each cycle.
Observing cervical secretions

• No noticeable secretions immediately following menses (duration usually three to four days)

• Scanty, cloudy, sticky secretions for the next few days (duration usually three to five days)

• Abundant, clear, wet secretions immediately before, during, and right after ovulation (duration usually three to four days)

• Absence of secretions until after the next menses (duration usually 11 to 14 days)
Ovulation method

Ovulation method users are counseled to avoid unprotected intercourse:

- During menses (because of the possibility that menstrual bleeding could obscure the presence of secretions, particularly in short cycles)

- On preovulatory days following days with intercourse (even if there are no secretions present, because of the possible confusion with semen)

- On all days with fertile secretions

- Until four days past the last day with wet secretions.
TwoDay method

- The woman avoids unprotected intercourse on all days with secretions and on the day immediately following days with secretions.

- The first-year correct use pregnancy rate was 3.5 per 100 women per year, and the typical use pregnancy rate was <14 per 100 women per year.
Symptothermal method

• requires women to observe and evaluate their cervical secretions several times each day

• take their temperature with a BBT thermometer each morning before rising

• The presence of cervical secretions is the primary indicator of the beginning of the fertile phase of the cycle, and BBT elevation (0.3 degree) is the primary indicator of the end of the fertile phase
Nonpharmacologic Therapy

Barrier Techniques

• The effectiveness of barrier methods and spermicides depends almost exclusively on a couple’s motivation to use them consistently and correctly

• These methods include condoms, diaphragms, cervical caps, and sponges

• A major disadvantage is higher failure rates than with most hormonal contraceptives; EC
Condoms

- Condoms are devices that create a mechanical barrier, preventing direct contact of the vagina with semen, genital lesions and discharges, and infectious secretions.

- Latex rubber, which is impermeable to viruses.

- Mineral oil–based vaginal drug formulations, lotions, or lubricants can decrease the barrier strength of latex by 90% in just 60 seconds, thus making water-soluble lubricants (e.g., K-Y Jelly) preferable.
Female Condom

• closed at one end, with flexible rings at both ends

• Properly positioned, the ring at the closed end covers the cervix, and the sheath lines the walls of the vagina

• The outer ring remains outside the vagina, covering the labia; this may make the female condom more effective than the male condom in preventing STDs

• pregnancy rate is reported to be 21% in the first year of use
Diaphragm

- reusable rubber cap with a flexible rim that is inserted vaginally, fits over the cervix in order to decrease access of sperm to the ovum

- Fitting!!!

- The diaphragm may be inserted up to 6 hours before intercourse and must be left in place for at least 6 hours afterward
Cervical Cap

- a soft, deep cup with a firm round rim that is smaller than a diaphragm and fits over the cervix like a thimble

- caps can be inserted 6 hours prior to intercourse and remain in place for multiple episodes of intercourse without adding more spermicide

- Failure rates are higher than with other methods, perhaps due to difficulty in fitting the cap
<table>
<thead>
<tr>
<th>Method</th>
<th>Absolute Contraindications</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Percent of Women with Pregnancya</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condoms, male</td>
<td>Allergy to latex or rubber</td>
<td>Inexpensive</td>
<td>High user failure rate</td>
<td>2 Typical Use 15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STD protection, including HIV (latex only)</td>
<td>Poor acceptance</td>
<td></td>
</tr>
<tr>
<td>Condoms, female (Reality)</td>
<td>Allergy to polyurethane</td>
<td>Can be inserted just before intercourse or ahead of</td>
<td>Possibility of breakage</td>
<td>5 Typical Use 21</td>
</tr>
<tr>
<td></td>
<td>History of TSS</td>
<td>STD protection, including HIV</td>
<td>Efficacy decreased by oil-based lubricants</td>
<td></td>
</tr>
<tr>
<td>Diaphragm with</td>
<td>Allergy to latex, rubber, or spermicide</td>
<td>Low cost</td>
<td>Possible allergic reactions to latex in either partner</td>
<td>6 Typical Use 16</td>
</tr>
<tr>
<td>spermicide</td>
<td>Recurrent UTIs</td>
<td>Decreased incidence of cervical neoplasia</td>
<td>High user failure rate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>History of TSS</td>
<td>Some protection against STDs</td>
<td>Decreased efficacy with increased frequency of intercourse</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Abnormal gynecologic anatomy</td>
<td></td>
<td>Increased incidence of vaginal yeast UTIs, TSS</td>
<td></td>
</tr>
<tr>
<td>Cervical cap (FemCap,</td>
<td>Allergy to spermicide</td>
<td>Low cost</td>
<td>Efficacy affected by oil-based lubricants</td>
<td>9 Typical Use 16b</td>
</tr>
<tr>
<td>Leah’s Shield)</td>
<td>History of TSS</td>
<td>Latex-Free</td>
<td>Cervical irritation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Abnormal gynecologic anatomy</td>
<td>Some protection against STDs</td>
<td>High user failure rate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Abnormal Papanicolaou smear</td>
<td>FemCap reusable for up to 2 years</td>
<td>Decreased efficacy with parity</td>
<td></td>
</tr>
<tr>
<td>Spermicides alone</td>
<td>Allergy to spermicide</td>
<td>Inexpensive</td>
<td>Cannot be used during menses</td>
<td>18 Typical Use 29</td>
</tr>
<tr>
<td></td>
<td>Recurrent UTIs</td>
<td></td>
<td>High user failure rate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>History of TSS</td>
<td></td>
<td>Must be reapplied before each act of intercourse</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Abnormal gynecologic anatomy</td>
<td></td>
<td>May enhance HIV transmission</td>
<td></td>
</tr>
<tr>
<td>Sponge (Today)</td>
<td>Allergy to spermicide</td>
<td>Inexpensive</td>
<td>No protection against STDs</td>
<td>9 Typical Use 16</td>
</tr>
<tr>
<td></td>
<td>Recurrent UTIs</td>
<td></td>
<td>High user failure rate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>History of TSS</td>
<td></td>
<td>Decreased efficacy with parity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Abnormal gynecologic anatomy</td>
<td></td>
<td>Cannot be used during menses</td>
<td></td>
</tr>
</tbody>
</table>

HIV, human immunodeficiency virus; STD, sexually transmitted disease; TSS, toxic shock syndrome; UTI, urinary tract infection.

aFailure rates in the United States during first year of use.
bFailure rate with FemCap reported to be 29% per package insert.

Data from Hatcher et al. and Dickay.
Pharmacologic Therapy

Spermicides

• Are chemical surfactants that destroy sperm cell walls and act as barriers that prevent sperm from entering the cervical os

• Offer no protection against STDs. when used frequently (more than two times per day), may increase the risk of transmission of HIV by causing small disruptions in the vaginal epithelium
Hormonal Contraception

• contain either a combination of estrogen & progestin or a progestin alone

• OC preparations first became available in the 1960s, but options have expanded to include:

  - transdermal patch
  - vaginal contraceptive ring
  - long-acting injections
  - implants
  - intrauterine contraceptives
Components

- Combined hormonal contraceptives (CHCs) work primarily before fertilization to prevent conception

- Progestins provide most of the contraceptive effect by:
  - thickening cervical mucus to prevent sperm penetration
  - slowing tubal motility and delaying sperm transport
  - inducing endometrial atrophy
  - blocking the LH surge, therefore inhibiting ovulation
Components

- Estrogens:
  - suppress FSH release from the pituitary
  - may contribute to blocking the LH surge and preventing ovulation
  - The primary role of estrogen in hormonal contraceptives is to stabilize the endometrial lining and provide cycle control
Benefits of CHC

• relief from menstruation-related problems (e.g., decreased menstrual cramps, decreased ovulatory pain, and decreased menstrual blood loss)

• improvement in menstrual regularity

• increased hemoglobin concentrations

• improvement in acne

• reduced risk of ovarian and endometrial cancer, which is detectable within 1 year and persists for years after discontinuation

• reduce the risk of ovarian cysts, ectopic pregnancy, pelvic inflammatory disease, and benign breast disease (cyst or fibroadenomas)
Benefits of CHC

• The CHC transdermal patch is convenient because it is applied only once weekly

• it may be associated with less breast discomfort and dysmenorrhea than Ocs

• The CHC vaginal ring also has the advantage of convenience, being inserted for 3 weeks at a time
Adverse Effects of CHC

• Estrogen excess can cause nausea and bloating

• Low-dose estrogen CHCs can cause early or midcycle breakthrough bleeding and spotting

• Progestins may be associated with fatigue and changes in mood

• Low-dose progestin CHCs may cause late-cycle breakthrough bleeding and spotting

• Androgenic activity derived from progestins may cause increased appetite and acne
<table>
<thead>
<tr>
<th>Adverse Effects</th>
<th>Management</th>
</tr>
</thead>
</table>
| **Estrogen excess**  | Decrease estrogen content in CHC  
|                      | Consider progestin-only methods or IUD                                    |
|                      | Decrease estrogen content in CHC  
|                      | Consider extended-cycle or continuous regimen OC                         |
|                      | Consider progestin-only methods or IUD NSAIDs for dysmenorrhea            |
| **Estrogen deficiency** | Increase estrogen content in CHC                                      |
|                      | Increase estrogen content in CHC                                        |
|                      | Exclude pregnancy                                                        |
|                      | Increase estrogen content in CHC if menses is desired                      |
|                      | Continue current CHC if amenorrhea acceptable                             |
| **Progestin excess** | Decrease progestin content in CHC                                         |
|                      | Decrease progestin content in CHC                                         |
|                      | Choose less androgenic progestin in CHC                                   |
|                      | Decrease progestin content in CHC                                         |
| **Progestin deficiency** | Increase progestin content in CHC                                 |
|                      | Consider extended-cycle or continuous regimen OC                         |
|                      | Consider progestin-only methods or IUD NSAIDs for dysmenorrhea            |
|                      | Increase progestin content in CHC                                         |

CHC, combined hormonal contraceptive; IUD, intrauterine device; NSAID, nonsteroidal antiinflammatory drug; OC, oral contraceptive.

*CHC regimens should be continued for at least 3 months before adjustments are made based on adverse effects.

Data from Hatcher et al. and Dickey.
Women older than 35 yrs

CHCs containing less than 50 mcg EE are an acceptable form of contraception for nonsmoking women up to the time of menopause.
Smoking

• Practitioners should prescribe CHC with caution, if at all, to women older than 35 years who smoke.

• The WHO precautions further state that smoking 15 or more cigarettes per day by women in this age group is a contraindication to CHC, and that the risks generally outweigh the benefits of CHC in those who smoke fewer than 15 cigarettes per day.

• Progestin-only contraceptive methods should be considered for women in this group.
Hypertension

• CHCs, even those containing less than 35 mcg of estrogen, can cause small increases (i.e., 6–8 mm Hg) in blood pressure

• Use of low-dose CHC is acceptable in women younger than 35 years with well-controlled and frequently monitored hypertension

• discontinuing the CHC usually restores BP to pretreatment values within 3 to 6 months

• Progestin-only pills and DMPA have not been shown to increase blood pressure or increase the risk of vascular events in normotensive or hypertensive women and therefore are choices for women with hypertension
Dyslipidemia

• Most low-dose CHCs have no significant impact on HDL, LDL, triglycerides, or total cholesterol

• Women with controlled dyslipidemia can use low-dose CHCs, although periodic fasting lipid profiles are recommended

• Women with uncontrolled dyslipidemia (LDL >160 mg/dL, HDL <35 mg/dL, triglycerides >250 mg/dL) and additional risk factors (e.g., CAD, diabetes, HTN, smoking, or positive family history) should use an alternative method of contraception
Diabetes

- Nonsmoking women younger than 35 years with diabetes but no associated vascular disease can safely use CHCs

- Diabetic women with vascular disease (e.g., nephropathy, retinopathy, neuropathy, or other vascular disease or diabetes of more than 20 years’ duration) should not use CHCs

- Copper and progestin-releasing IUDs have not been associated with impaired metabolic control in women with uncomplicated diabetes
Migraine Headache

• may experience a decreased or an increased frequency of migraine headaches when using CHCs

• In population-based studies, the risk of stroke in women with migraines has been elevated twofold to threefold (more aura)

• ACOG recommends considering CHCs in healthy, nonsmoking women with migraine headaches if they do not have focal neurological signs

• Women of any age who have migraine with aura should not use CHC

• Women who develop migraines (with or without aura) while receiving CHC should discontinue use immediately
Breast cancer

- The choice to use CHCs should not be affected by the presence of benign breast disease or a family history of breast cancer.

- The WHO precautions state that women with a recent personal history of breast cancer should not use CHCs, but that CHCs can be considered in women without evidence of disease for 5 years.
Thromboembolism

• Estrogens increase hepatic production of factor VII, factor X, and fibrinogen in the coagulation cascade

• These risks are increased in women who have underlying or acquired hypercoagulable states (e.g., obesity, pregnancy, immobility, trauma, surgery, and certain malignancies)

• the risk of venous thromboembolism (VTE) in women currently using low-dose OCs (<50mcg EE with norethindrone or levonorgestrel) was four times the risk in nonusers

• OCs containing desogestrel have been associated with a 1.7 to 19 times higher risk of VTE than OCs containing levonorgestrel
Thromboembolism

• CHCs are contraindicated in women with a history of thromboembolic events and in those at risk due to prolonged immobilization with major surgery unless they are currently taking anticoagulants

• DMPA and levonorgestrel IUDs are also recommended for this population

• EC has not been associated with an increased risk of thromboembolic events
Obesity

• Obese women (weight >90 kg) taking OCs or using transdermal contraceptives are at increased risk for contraceptive failure compared to women with a normal BMI

• Because increased pregnancy rates have not been documented in obese women using DMPA as the method of contraception, this or intrauterine methods of contraception should be considered
SLE

- CHCs should be avoided in women with SLE and antiphospholipid antibodies or vascular complications

- progestin-only contraceptives can be used in this situation
Oral Contraceptives

• When OCs are used correctly, their effectiveness approaches that of surgical sterilization

• With perfect use, their efficacy is greater than 99%, but with typical use, up to 8% of women may experience unintended pregnancy

• Monophasic, Biphasic, triphasic

• combination multiphasic formulations have further lowered the total monthly hormonal dose without clearly demonstrating any significant clinical differences
Oral Contraceptives

• Third generations: desogestrel, drospirenone, gestodene, and norgestimate

• potent progestational agents that appear to have no estrogenic effects and are less androgenic compared with levonorgestrel on a weight basis

• improved side-effect profiles, such as improving mild to moderate acne

• Drospirenone also has antimineralocorticoid and antialdosterone activities, which may result in less weight gain compared to use of OCs containing levonorgestrel
Category 4: Refrain from providing CHCs for women with the following diagnoses

- Thrombophlebitis or thromboembolic disorder, or a history of these conditions
- Cerebrovascular disease, coronary artery disease, peripheral vascular disease
- Valvular heart disease with thrombogenic complications (e.g., pulmonary hypertension, atrial fibrillation, history of endocarditis)
- Diabetes with vascular involvement (e.g., nephropathy, retinopathy, neuropathy, other vascular disease or diabetes >20 years’ duration)
- Migraine headaches with focal aura
- Migraine headaches without aura in women ≥35 years old should discontinue CHC
- Uncontrolled hypertension (≥160 mm Hg systolic or ≥90 mm Hg diastolic)
- Major surgery with prolonged immobilization
- Thrombogenic mutations (e.g., factor V Leiden, protein C or S deficiency, antithrombin III deficiency, prothrombin deficiency)
- Breast cancer
- Acute or chronic hepatocellular disease with abnormal liver function, cirrhosis, hepatic adenomas, or hepatic carcinomas
- Age >35 years and currently smoking ≥15 cigarettes per day
- Known or suspected pregnancy
- Breast-feeding women <6 weeks postpartum
Progestin-only

- Tend to be less effective than combination OCs
- Are associated with irregular and unpredictable menstrual bleeding

Minipills
- must be taken every day of the menstrual cycle at approximately the same time to maintain contraceptive efficacy

- If a progestin-only pill is taken more than 3 hours late, patients should use a backup method of contraception for 48 hours

- Because minipills may not block ovulation (nearly 40% of women continue to ovulate normally), the risk of ectopic pregnancy is higher with their use than with use of other hormonal contraceptives
Initiation

• “quick start” method for initiating OCs, the patient takes the first pill on the day of her office visit (after a negative urine pregnancy test)

• Women should be instructed to use a second method of contraception for at least 7 days

• Inform that the menstrual period will be delayed until completion of the active pills in the current OC pill pack

• No evidence shows increased bleeding irregularities with this method of OC initiation
Initiation

• In the first-day start method, women take the first pill on the first day of the next menstrual cycle

• The Sunday start method was the most common method of initiating OCs for years

• Women started OCs on the first Sunday after starting the menstrual cycle

• Sunday start methods result in “period-free” weekends
Postpartum

- there is concern about use of Ocs because of the mother’s hypercoagulability and the effects on lactation

- The WHO precautions state that, in the first 21 days postpartum (when the risk of thrombosis is higher), estrogen-containing hormonal contraceptives should be avoided if possible

- If contraception is required during this period, progestin-only pills and IUDs (progesterone or copper) are acceptable choices

- WHO recommends that women who are breast-feeding avoid CHC in the first 6 weeks postpartum
Choice of OC

• all combined OCs are similarly effective in preventing pregnancy

• Women weighing more than 160 lb (72.7 kg) may have higher contraceptive failure rates with low-dose OCs and may benefit from pills containing 35–50 mcg of EE

• Women with regular heavy menses initially may benefit from a 50-mcg EE OC as well because of their higher endometrial activity

• Women with oily skin, acne, and hirsutism should be given low androgenic OCs
Candidates for progestin only

- migraine headaches
- History of thromboembolic disease
- heart disease
- Cerebrovascular disease
- SLE with vascular disease
- hypertriglyceridemia

Women older than 35 years:

- smokers
- Obese
- hypertension
- vascular disease
OC’s side effects

• Many symptoms occurring with early OC use (e.g., nausea, bloating, breakthrough bleeding) improve spontaneously by the third cycle of use after adjusting to the altered hormone level.

• Patient education and early reevaluation (i.e., within 3–6 months) are necessary to identify and manage adverse effects, in an effort to improve compliance.

• Patients should be instructed to immediately discontinue CHCs if they experience warning signs, **ACHES** (abdominal pain, chest pain, headaches, eye problems, and severe leg pain).
<table>
<thead>
<tr>
<th>Serious Symptoms</th>
<th>Possible Underlying Problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blurred vision, diplopia, flashing lights, blindness, papilledema</td>
<td>Stroke, hypertension, temporary vascular problem of many possible sites, retinal artery thrombosis</td>
</tr>
<tr>
<td>Numbness, weakness, tingling in extremities, slurred speech</td>
<td>Hemorrhagic or thrombotic stroke</td>
</tr>
<tr>
<td>Migraine headaches</td>
<td>Vascular spasm, stroke</td>
</tr>
<tr>
<td>Breast mass, pain, or swelling</td>
<td>Breast cancer</td>
</tr>
<tr>
<td>Chest pain (radiating to left arm or neck), shortness of breath, coughing up blood</td>
<td>Pulmonary embolism, myocardial infarction</td>
</tr>
<tr>
<td>Abdominal pain, hepatic mass or tenderness, jaundice, pruritus</td>
<td>Gallbladder disease, hepatic adenoma, pancreatitis, thrombosis of abdominal artery or vein</td>
</tr>
<tr>
<td>Excessive spotting, breakthrough bleeding</td>
<td>Endometrial, cervical, or vaginal cancer</td>
</tr>
<tr>
<td>Severe leg pain (calf, thigh), tenderness, swelling, warmth</td>
<td>Deep-vein thrombosis</td>
</tr>
</tbody>
</table>
Drug Interactions

- The ACOG states that ampicillin, doxycycline, fluconazole, metronidazole, miconazole, fluoroquinolones, and tetracyclines do not decrease steroid levels in women taking Ocs.

- The Council on Scientific Affairs at the American Medical Association recommends that women taking rifampin should be counseled about the risk of OC failure and advised to use an additional non-hormonal during the course of rifampin therapy.
Drug Interactions

• The council also recommends that women be informed about the small risk of interactions with other antibiotics, and, if desired, appropriate additional nonhormonal contraceptive agents should be considered.

• Women who develop **breakthrough bleeding** during concomitant use of antibiotics and OCs (and other CHCs) should be advised to use an alternate method of contraception during the period of concomitant use.

• Some anticonvulsants (mainly phenobarbital, carbamazepine, phenytoin) induce the metabolism of estrogen and progestin, inducing breakthrough bleeding and potentially reducing contraceptive efficacy.
Patient instructions

• Use of an additional contraceptive method is advisable if the patient misses taking a pill or experiences severe diarrhea or vomiting for several days.

• The patient taking combination OCs should expect her menses to start within 1 to 3 days after taking the last active pill.

• She should start another pack of pills 1 week after finishing the previous 21-day pack, even if her menses is not completed.
**TABLE 82-7 Recommendations for Missed Oral Contraceptive Doses**

<table>
<thead>
<tr>
<th>Number of Pills Missed</th>
<th>Week in Which Pills Were Missed</th>
<th>Recommendation</th>
<th>Use of 7-Day Back Up Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Take two pills as soon as possible Finish the pill pack Use emergency contraception if necessary</td>
<td>Yes</td>
</tr>
<tr>
<td>1</td>
<td>2–3</td>
<td>Take two pills as soon as possible Finish the pill pack</td>
<td>No</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
<td>Skip placebo pills Finish the pill pack</td>
<td>No</td>
</tr>
<tr>
<td>2–4</td>
<td>1</td>
<td>Take two pills as soon as possible Finish the pill pack Use emergency contraception if necessary</td>
<td>Yes</td>
</tr>
<tr>
<td>2–4</td>
<td>2</td>
<td>Take two pills as soon as possible Finish the pill pack Use emergency contraception if necessary</td>
<td>Yes</td>
</tr>
<tr>
<td>2–4</td>
<td>3</td>
<td>Start a new pill pack</td>
<td>No</td>
</tr>
<tr>
<td>2–4</td>
<td>4</td>
<td>Skip placebo pills Finish the pill pack</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>Any</td>
<td>Take two pills as soon as possible Start a new pill pack Use emergency contraception if necessary</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*Alternative recommendation is to take one of the missed pills every 12 hours until caught up, then continue the rest of the pill pack.*

*Data from Hatcher et al. and Didkey.*
Return of fertility

• The average delay in ovulation after discontinuing OCs is 1 to 2 weeks, but delayed ovulation is more common in women with a history of irregular menses.

• Traditionally, women are counseled to allow two to three normal menstrual periods before becoming pregnant to permit the reestablishment of menses and ovulation.
Hormonal Contraception

Transdermal patch

• to be as effective as combined OCs in patients weighing less than 90 kg

• Is not recommended as a first-line option for women weighing more than 90 kg

• patch should be applied to the abdomen, buttocks, upper torso, or upper arm at the beginning of the menstrual cycle and replaced every week for 3 weeks (the fourth week is patch-free)
Vaginal Ring

• Over a 3-week period, the ring releases approximately 15 mcg/day of EE and 120 mcg/day of etonogestrel

• Comparative trials have shown the vaginal ring to be as effective as combined Ocs

• On the first cycle of use, the ring should be inserted on or before the fifth day of the menstrual cycle, remain in place for 3 weeks, then removed for 1 week to allow for withdrawal bleeding

• In contrast to diaphragms and cervical caps, precise placement is not an issue
Long acting injectable contraceptions

Sustained progestin exposure:

- blocks the LH surge, thus preventing ovulation
- Should ovulation occur, progestins reduce ovum motility in the fallopian tubes
- Even if fertilization occurs, progestins thin the endometrium, reducing the chance of implantation
- Progestins also thicken the cervical mucus, producing a barrier to sperm penetration
Progestin-only methods

Particularly benefit:

- breast-feeding
- those who are intolerant to estrogens (i.e., have a history of estrogen-related headache, breast tenderness, or nausea)
- those with concomitant medical conditions in which estrogen is not recommended
- Injectable and implantable contraceptives are beneficial for women with compliance issues
Long acting progestins

- Pregnancy failure rates with long acting progestin contraceptives are comparable to the rates with female sterilization.

- DMPA 150 mg (Depo-Provera) is administered by deep intramuscular injection in the gluteal or deltoid muscle within 5 days of onset of menstrual bleeding and inhibits ovulation for more than 3 months.

- With perfect use, the efficacy of DMPA is more than 99%; however, with typical use, 3% of women experience unintended pregnancy.
DMPA

• Although these injections may inhibit ovulation for up to 14 weeks, the dose should be repeated every 3 months (12 weeks) to ensure continuous contraception.

• The manufacturer recommends excluding pregnancy in women with a lapse of 13 or more weeks between injections.

• Although no adverse effects have been documented in infants exposed to DMPA through breast milk, the manufacturer recommends not initiating DMPA until 6 weeks postpartum in breastfeeding women.
Because return of fertility may be delayed after discontinuation of DMPA, it should not be recommended to women desiring pregnancy in the near future.

The median time to conception from the first omitted dose is 10 months.

Menstrual irregularities, including irregular, unpredictable spotting or, more rarely, continuous heavy bleeding, are the most frequent adverse effects.

Women who cannot tolerate prolonged bleeding may benefit from a short course of estrogen (e.g., 7 days of 1.25-mg conjugated estrogen given orally).
Adverse Effects

- breast tenderness, weight gain, and depression, occur less commonly (<5%)

- However, data suggest that DMPA may actually improve depression, and use of DMPA in women with depression may be appropriate with close monitoring.

- Weight gain averages 1 kg annually and may not resolve until 6 to 8 months after the last injection.
Adverse Effects

• **Black box warning** that addresses the association between DMPA use and decreased BMD, specifically in adolescent and young women.

• WHO and ACOG guidelines recommend against the use of DXA in short- and long-term DMPA users due to the limited clinical utility of monitoring BMD in this population.

• DMPA has not been associated with the development of osteoporosis or fractures, and discontinuation of DMPA results in return to baseline BMD values within 12 to 30 months.

• FDA added a black box warning to DMPA, recommending continued use of more than 2 years only if other contraceptive methods were inappropriate.

• Calcium & Vit D, exercise.
Subdermal Progestin Implant

• The Norplant contraceptive system was a set of six implantable, nonbiodegradable, soft silicone rubber capsules, each filled with 36-mg crystalline levonorgestrel, that provided continuous contraception for up to 5 years

• Although extremely effective, Norplant was removed from the U.S. market in 2003 due to difficulty with insertion and removal

• Implanon is the progestin implant currently available in the United States
Intrauterine Devices

- The low-grade intrauterine inflammation and increased prostaglandin formation caused by IUDs

- Endometrial suppression caused specifically by the progestin-releasing IUD appear to be primarily spermicidal

- Although interference with implantation is a backup mechanism
IUDs

• Efficacy rates with IUDs are greater than 99% with both perfect and typical use

• Copper; Levonorgestrol

• Increased risk of infection appears to be related to introduction of bacteria into the genital tract during IUD insertion

• The risk is highest during the first 20 days after the procedure

• Ideal patients for IUD use: at least one child, who are monogamous and are not at risk for STDs or pelvic inflammatory disease, no history or risk of ectopic pregnancy
PAINS

• **P**: period late

• **A**: abdominal pain

• **I**: Infection, abnormal or odorous vaginal discharge

• **N**: Not feeling well, fever, chills

• **S**: String (missing, shorter, longer)
Emergency contraception

- EC is used to prevent unwanted pregnancy after unprotected sexual intercourse (e.g., condom breakage, diaphragm dislodging, or sexual assault)

- Higher doses of combined estrogen and progestin or progestin-only containing products can be used

- Insertion of copper IUD is an option, although it is not an FDA approved or a widely used method of EC

- EC may prevent the fertilized egg from implanting into the endometrium, impaired sperm transport and corpus luteum function

- After intercourse, implantation of the fertilized egg typically takes approximately 5 days
Emergency contraception
what you need to know?

• Confirmation of unprotected sex or contraceptive failure

• When unprotected sex occurred

• Could the women already be pregnant
  EC will not work if woman is pregnant
  There is no evidence that EC is harmful to pregnancy

• Other medicines
Other medicines

- Anticonvulsants (CBZ, phenytoin, primidone, phenobarbital)
- Rifampin
- Griseofulvin
- Ritonavir
- St john’s wort
EC

• It contains two white tablets, each containing 0.75 mg of levonorgestrel.

• The first dose is taken within 72 hours of unprotected intercourse (although the sooner, the more effective); the second dose is taken 12 hours later.

• One study found that 1.5 mg of levonorgestrel (two tablets) taken as a single dose was as effective as taking the doses 12 hours apart and did not cause an increased incidence of adverse effects.

• Although this single dose regimen is not FDA approved, it is a reasonable option, especially in women who may not be compliant with the two-dose regimen.
EC

- use of regular combined contraceptives for EC still is permissible

- Although some studies suggest that they may not be as effective and may be associated with more adverse effects

- The efficacy of all EC regimens declines if they begin more than 72 hours after intercourse

- However, one study suggests that EC may still be effective when used up to 120 hours after intercourse and should be considered in some women when use is delayed

- It is recommended that women have an advanced prescription on hand to maximize the effectiveness of EC
Adverse effects

- nausea, vomiting, and irregular bleeding

- Nausea and vomiting occur significantly less when Plan B is administered

- If the combined contraceptive method is prescribed, antiemetics given 1 hour before the dose is taken may be warranted

- Many women will experience irregular bleeding regardless of which EC method is used, with the menstrual period usually occurring 1 week before or after the expected time

- No current data regarding the safety of repeated use EC are available, but current consensus suggests the risks are low
When to refer

• Longer than 72 h since unprotected sex

• Taking medicines that interact with EC
Advise to patients

- Take as soon as possible
- Vomiting within 3 h
- Next period may start earlier, on time or later
- If it is lighter, shorter or more than 3 days later than usual
- Can be used on more than 1 occasion in the same cycle but it is likely to disrupt the cycle
Advise to patients

- No safety concerns about repeated use
- Difficult to keep track of her cycle
- Is less effective than other methods
THANK YOU FOR YOUR TIME