CONTRACEPTION: MODULE I
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METHODS OF CONTRACEPTION:
1. ESTROGEN & PROGESTERONE
2. PROGESTERONE ONLY
3. NONHORMONAL
Contraception

Important factors to consider when selecting a contraceptive method:

- Patient preferences/previous experiences
- Age
- Health status
- Cost
- Convenience
- Time to return of fertility after cessation
- Efficacy
- Length of protection
- Difficulty of use
- Lack of access to health care
- Safety concerns
- Compliance issues

Menstrual Cycle
MOA of Contraception

• **Progesterone:**
  • Suppresses LH surge (needed for ovulation)
  • Thickens cervical mucous (impede sperm penetration)
  • Slows tubal motility (delays transport of the ovum & sperm)
  • Causes atrophy of endometrium (prevents implantation)

• **Estrogen:**
  • Suppresses FSH release (suppresses development of dominant follicle)
  • Adds to cycle control (decreases irregular bleeding found with progesterone only methods)

1. ESTROGEN & PROGESTERONE METHODS
Combined Oral Contraceptives (COCs)

• Contain:
  • 1. ethinyl estradiol (EE) (20 - 35 mcg)
    • 20 mcg = Alesse
    • 25 mcg = Ortho-Tricyclen Lo
    • 30 mcg = Desogen
    • 35 mcg = Ortho-Cyclen
  • AND
  • 2. a variety of progestin components

OCs Biological Activities

• Biological Activities:
  • 1. estrogenic activity
  • 2. progestational activity
  • 3. androgenic activity
  • 4. endometrial activity
  • 5. effect on serum lipoproteins

• Each OC has a different pattern of biological activity due to its individual steroid components

• The results of these activities may be seen in the side effects that occur when there is an excess or deficiency of one of the components.

• Endometrial, progestational & androgenic profiles (low, intermediate, high) of individual OCs are listed in Managing Contraceptive Pill Patients by Richard P. Dickey
Progestins

- **Androgenic activity**
  - **First generation**: norethindrone
    - Spotting; break through bleeding (BTB)
  
  - **Second generation**: norgestrel, levonorgestrel
    - Increased androgenic activity:
      - Decrease BTB
      - Increase acne, hirsutism, dyslipidemia

- **Third generation**: desogestrel, norgestimate
  - Decreased androgenicity
  - Lessened acne & hirsutism
  - Lessened adverse effects on carbohydrate & lipid metabolism

- **Fourth generation**: drosperinone (Yaz) – derivative of spironolactone
  - Low androgenicity (help with acne & hirsutism)
  - Mild diuretic & antimineralocorticoid effects (may cause hyperkalemia)

- **Third & Fourth generations**:
  - Improved complexion
  - Less weight changes
  - Reduced mood swings
  - ***Increased risk of venous thrombosis (greater estrogenic activity)***
Combined Oral Contraceptives (COCs)

- **Monophasic**
  - Same dose in each active pill
  - Ex: OrthoCyclen

- **Triphasic**
  - Dose of estrogen, progesterone or both changes
  - Ex: Ortho-Tricyclen (prog changes)
  - Ex: Estrostep (estrogen changes)

- **Extended cycle**
  - 84 active pills with 7 days off
  - Ex: Seasonique (EE 30 mcg/10 mcg)
  - Ex: Amethyst (EE 20 mcg/levonorgestrel x 28 days)

Combined Oral Contraceptives (COCs)

- **MOA:**
  - Inhibits ovulation, thickens cervical mucus, thins endometrial lining, alters tubal transport

- **Failure Rate:**
  - Less than 0.3% -3% with perfect use

- **Advantages:**
  - May improve dysmenorrhea, metrorrhagia, premenstrual syndrome, hirsutism, acne, endometriosis
  - Correct menstrual irregularity
  - May manipulate cycle to avoid menses by skipping placebo week
  - May help prevent benign breast disease
  - Fewer ovarian cysts
  - Reduction/elimination of ovulation associated pain (mittle schmerz)
  - Reduces risk of ovarian & endometrial cancer
  - Fertility immediately reestablished after cessation of use
Combined Oral Contraceptives (COCs)

**Disadvantages:**
- **Adverse effects:** nausea, breast tenderness, bloating, breakthrough bleeding (BTB), amenorrhea, headaches, decreased libido
- No protection from STDs
- Decreased milk production in breastfeeding mothers
- Risk of venous thromboembolic (VTE) disease
- Cigarette smoking increases risk of CV adverse effects

**Contraindications:** **WHO Category 4 Unacceptable Risk**
- Age > 35 yr & smoker > 15 cigarettes/day
- Hypertension, not controlled or with vascular disease
  - Systolic ≥ 160 or diastolic ≥ 100
- Current or hx of DVT/PE
- Major surgery with prolonged immobilization
- Known thrombogenic mutations
- Current or hx of ischemic heart disease
- Current or hx of stroke
- Valvular heart disease, complicated
- Migraine with neurologic aura
- SLE with +or unknown antiphospholipid antibodies
- Current breast cancer
- Active viral hepatitis
- Cirrhosis, severe/decompensated
- Benign hepatocellular adenoma or malignant liver tumor
Combined Oral Contraceptives (COCs)

• **How to Start COCs:**
  1. **First Day Start**
     • 1st pill is taken on first day of menstrual cycle
     • No BUM needed
  2. **Sunday Start**
     • 1st pill is taken on Sunday following the start of menses
     • BUM x 7 days
  3. **Quick Start**
     • 1st pill is taken on day of the office visit
     • BUM x 7 days
     • Reasonably sure patient is not currently pregnant

• **Missed COCs:**
  - Missed 1 active pill
    • Take as soon as you remember (2 pills in 1 day)
    • BUM x 7 days
  - Missed 2-4 active pills
    • Take 2 pills/day for 2-3 days
    • BUM x 7 days
  - Missed ≥ 5 active pills
    • SCREAM...just forget it! Got to start over! Start new pack on next start day!
    • BUM until 7 days of active pills

• **IF IN DOUBT, TAKE ACTIVE PILLS FOR 7 CONSECUTIVE DAYS AND USE BUM!**
Combined Oral Contraceptives (COCs)

• F/U:
  • 3 month after initiation assess:
    • BP
    • Adverse effects
    • Compliance
  
  • Then, assess annually if no problems
  
  • Need to switch doses/brands?

COCs: Common Adverse Effects

• 1. Nausea
  • If initially, may go away
  • Take with food
  • Take at bedtime
  • May be estrogen excess

• 2. Breakthrough Bleeding (BTB)
  • If initially, may go away
  • More frequent with progestin only methods
  • May try short course of anti-inflammatory
  • May be estrogen deficiency especially if:
    • Continuous BTB or BTB early in cycle
    • (BTB later in cycle = progestin deficiency)

• 3. Mood Swings
  • Progesterone related
  • May be with all hormonal methods; antidepressant?
**COCs: Common Adverse Effects**

• 4. Decreased libido  
  • Need more androgenic progesterone

• 5. Breast enlargement/tenderness  
  • If initially, may go away  
  • May be estrogen excess

• 6. Headache  
  • If initially, may go away  
  • May be estrogen excess

• 7. Weight Gain  
  • Not research supported with COCs  
  • Bloating, fluid retention  
  • More related to progestin only methods

**Combined Oral Contraceptives (COCs)**

• **Decreased effectiveness with:**  
  • Obesity (>200 lbs)

• Antimicrobials (Rifampin - 3A4 inducer)  
  • PCN & tetracycline (enterohepatic reabsorption; decreased gut bacteria that liberates the drug reabsorbed into bloodstream/body)

• Antifungal (griseofulvin – 3A4 inducer)

• Antiepileptic (Dilantin, Tegretol)  
  • ok with Neurontin, Lamictal
Combination Contraceptive Vaginal Ring: NuvaRing

- Flexible, transparent vaginal ring

Dose:
- Ethinyl estradiol 15 ug
- Etonorgestrel 120 ug
- Remains in vagina for 3 weeks & then removed by the patient to induce menstruation; new ring inserted after 1 full week

Efficacy similar to COCs
- If ring falls out, efficacy is not diminished if it is reinserted within 3 hours

Combination Contraceptive Vaginal Ring: NuvaRing

Advantages:
- Once a month administration increases compliance
- Provides steady, lower systemic hormone levels, thereby diminishing adverse effects from hormone level variation (eg, headache)

Disadvantages:
- Increased rates of vaginal discharge
- Possibility of ring dislodgment during intercourse

Major Complications:
- Same as COCs
Combination Contraceptive Patch: Ortho-Evra Patch

• A patch applied weekly for 3 weeks, followed by a fourth week patch free, during which withdrawal bleeding is expected

• **Efficacy:** 0.3% correct use; 8% typical use
  • Efficacy may be diminished if patient weighs more than 200 lbs

• **Dose:** delivers every 24 hours -
  • Ethinyl estradiol 20 ug
  • Norelgestromin 150 ug

• **First Time Application:**
  • First 24 hrs of menstruation (no BUM needed)
  • First Sunday after initiation of menstruation (BUM x 7 days)

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Combination Contraceptive Patch: Ortho-Evra Patch

• **Advantages:**
  • Once-a-week regimen may be easier to remember than daily pills
  • Easy to apply
  • May not have as many drug interactions

• **Disadvantages:**
  • Visible (abdomen, upper torso, outer arm, buttock)
  • May fall off
  • May irritate skin
  • Adverse Effects: similar to COCs
    • Controversy regarding whether the 60% higher estradiol concentration of the patch translate into a higher risk of VTE

• **Major Contraindications:**
  • Same as COCs