



# Contraception

**Birth control methods available in Poland**

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# Lecture Outline

- Why contraception is so important?
- Effectiveness calculation - Perfect use vs. typical use
- Fertility awareness methods
- Chemical contraception
- Barrier contraception
- Hormonal contraception
  - Contraception without estrogen based only on synthetic progestins
    - Injectable progestogens Depo-Provera (DMPA).
    - Progestogen-only pills (POPs).
  - Hormonal combined (estrogen-progestogen) contraception
    - Oral contraception composition pills
    - Transdermal Patch
    - Vaginal ring
- Mirena – Intrauterine hormonal system
- Emergency contraception



# **Why contraception is so important?**

- **Globally: - stabilizes the earth population**
- **Individually: protects against unintended pregnancy**



## **Every day :**

- 100 millions of intercourses**
- 1 million pregnancies**
- 500 thousand unintended pregnancies**
- 250 thousand undesired pregnancies**
- 50 thousand abortions**
- 25 thousand induced abortions**
- 500 women die due to abortion complications.**

**More then 3 000 women die every week.**

**It is more then the number of victims of the terrorist attack to the World Trade Center on September 11th. 2001**



# **EFFECTIVENESS CALCULATION**

- **Failure rates are calculated by PEARL INDEX (PIND):**
- **PIND = the number of unintended pregnancies in 100 woman-years of exposure (e.g. 100 women over one year of use, or 10 women over 10 years) or,  
PIND= the number of unintended pregnancies during 1200 cycles.**
- **It is used to compare birth control methods**
- **Lower PIND representing a lower chance of getting unintentionally pregnant.**



# **PIND for UNPROTECTED INTERCOURSE = 85-90**

Perfect use vs. typical use

**The typical-use failure rates are higher than perfect-use rates for a variety of reasons:**

- **mistakes on the part of those providing instructions on how to use the method.**
- **mistakes on the part of the method's users.**
- **conscious user non-compliance with method.**



# **Birth control methods:**

- **I. Fertility awareness methods**
- **II. Chemical**
- **III. Barrier**
- **IV. Hormonal**



# **I. NATURAL METHODS:**

## **Fertility Awareness Methods**

### **Basic assumption**

- Sperm cell (spermatozoon) lives 3-5 days
- Oocyte lives 1 day

- Fertile window is ~6 days
  - 5 days prior to ovulation plus day of ovulation
  - Timing of ovulation variable
- Methods all try to predict ovulation





# **I. NATURAL METHODS:**

## **Fertility Awareness Methods**

- I. 1. Rhythm method - Calendar method**
- I. 2. The cervical mucus method**
- I. 3. Thermal method – Basal body temperature method**
- I. 4. Symptothermal method (combo of 2<sup>nd</sup> and 3<sup>rd</sup>)**

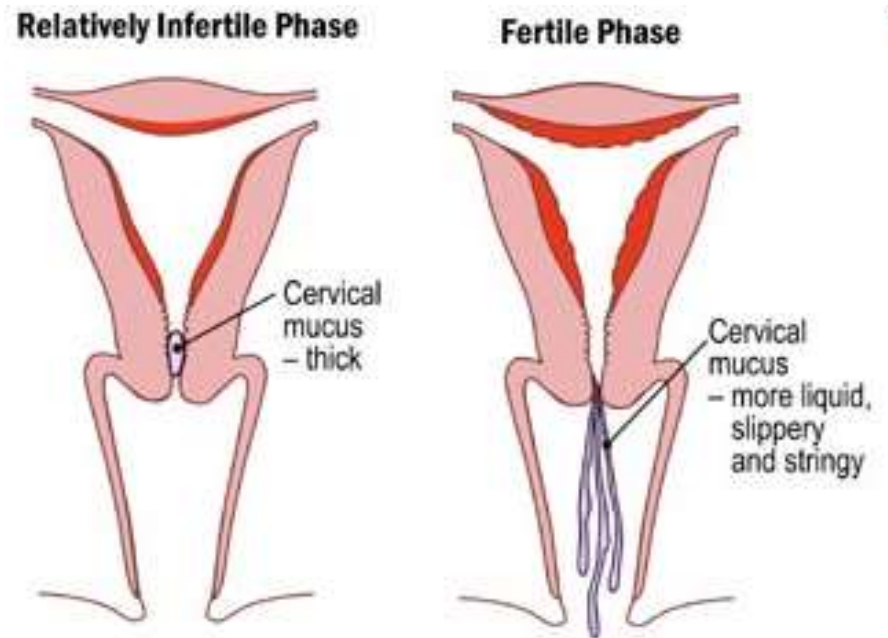


## I.1. The rhythm method

- The rhythm method is based on calendar calculations of previous menstrual cycles.
- Requires a woman to count back 14 days from the first day of present period to find out the day on which she ovulated and will ovulate the following month.
- Woman will need to abstain from sex or use another form of birth control, like condoms, 5 days before and 1-2 days after this time.
- **EFFECTIVENESS: PIND = 25-9**

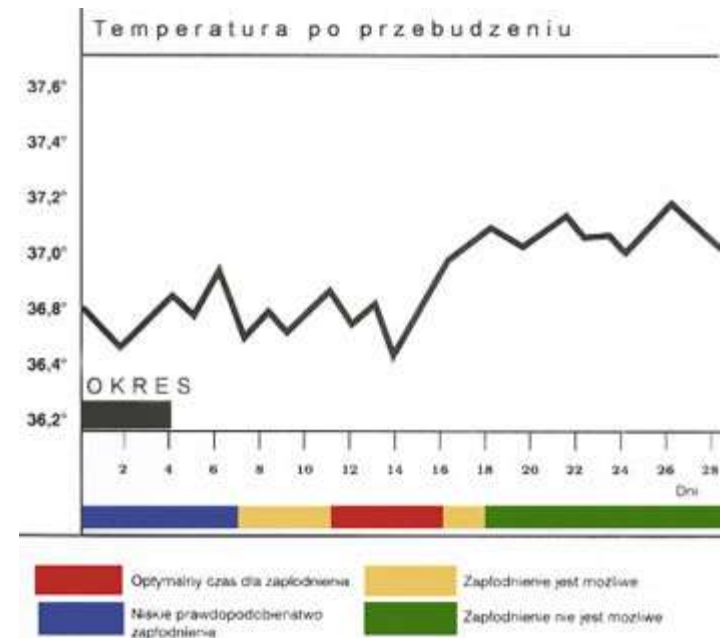
## I.2. The mucus method (Billing's):

- As ovulation approaches, the mucus becomes clear and slippery and stretches without breaking, like a raw egg white.
- The last day of peak wetness is right before ovulation.
- **EFFECTIVENESS: PIND = 25-3**



## I.3. The thermal method

- Temp is measured immediately after awakening and before any physical activity.
- Ovulation causes an increase of one-quarter to one-half degree Celsius in basal body temperature (BBT).
- Monitoring of BBTs is one way of estimating the day of ovulation.
- **EFFECTIVENESS: PIND = 25-3**





## **I.4. Symptothermal method**

- **This method involves determining ovulation time in two ways:**
  - # based on a woman's basal body temperature (thermal method) and**
  - # by observing cervical mucus ( the mucus method).**
- **EFFECTIVENESS: PIND = 25-1**

## II. CHEMICAL METHODS:

- II. 1. Vaginal irrigation

**EFFECTIVNESS: PIND = no data**



- II. 2. Chemical agents (nonoksynol)

Spermicidal gel,  
foam,  
suppository

**EFFECTIVNESS: PIND = 29-18**



## **III. BARRIER METHODS:**

- **III.1. CONDOMS**
- **III.2. DIAPHRAGM, CERVICAL CAP**
- **III.3. INTRAUTERINE DEVICE (IUD)**

**Basic assumption:**

**These methods prevent pregnancy by blocking sperm from getting into the uterus, or prevent the egg from attaching to spermatocyte.**

## III.1. CONDOM

- Condoms are an especially good choice if you or your partner are also having sex with other people or if either of you have had sex with other people in the past.
- Of all the barrier method options, condoms offer the most protection against AIDS and other STDs.
- **EFFECTIVENESS: PIND = 15-2**



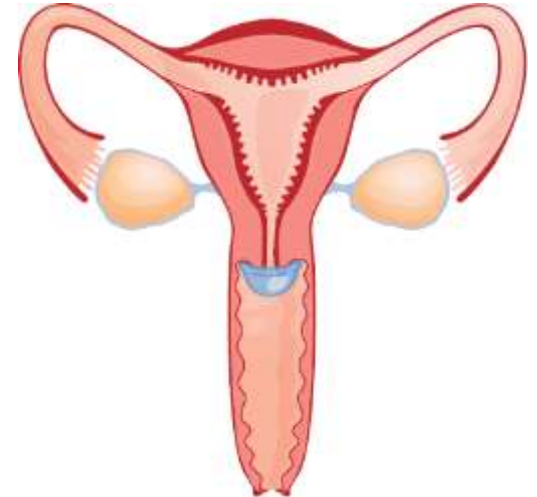


## III.2. DIAPHRAGM, CERVICAL CAP

- A woman must visit her doctor to be fitted for a diaphragm or a cervical cap.

### Side effects

- Usage may increase the risk of urinary tract infections in some women.
- Some women have allergic reactions with these methods.
- EFFECTIVENESS: PIND = 16-9



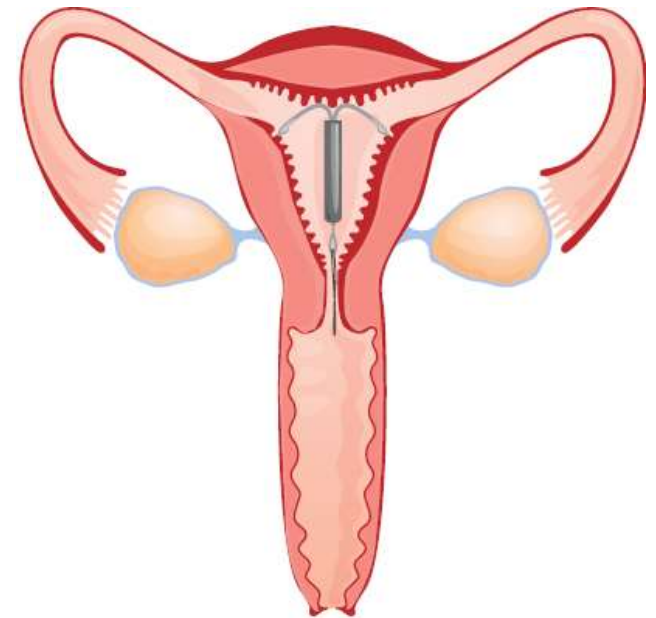
### III.3. INTRAUTERINE DEVICE (IUD)

#### What is it?

- IUD is a small, T-shaped device put in a woman's uterus by trained doctor.

#### How does it work?

Probablyly mechanical barrier in concert with local inflammation block sperm from getting into the uterus, and prevent the egg from attaching to it .



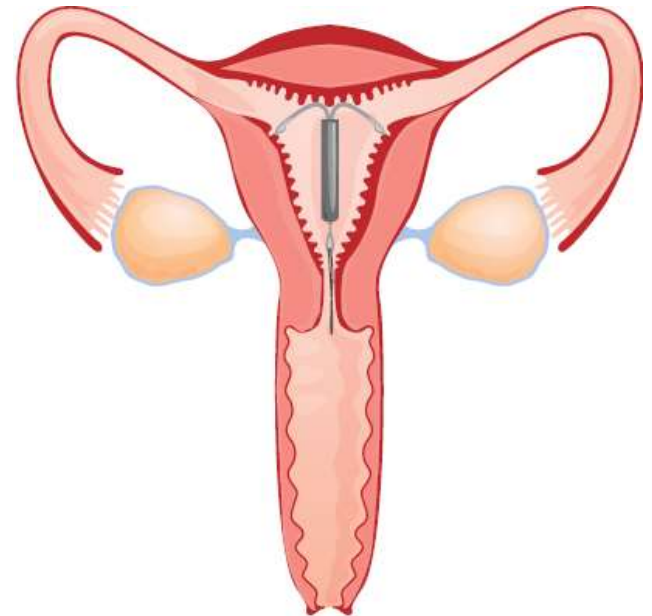
## Side effects

- menstrual periods are often heavier, more painful, or both - especially for the first few months after they are inserted.

## Precautions

- only for women who have delivered

EFFECTIVENESS: PIND = 0,8 – 0,6





## **IV. HORMONAL CONTRACEPTION:**

### **IV.1. Contraception without estrogen based only on synthetic progestins**



## 2 systems available in Poland:

**VI.1.a.** Injectable progestogens **Depo-Provera** (DMPA)

**VI.1.b.** Progestogen-only pills (POPs) (**Cerazette**)



## VI.1.a. Injectable progestogens Depo-Provera (DMPA)

Injections are required every 12 weeks  
Extremely effective in preventing pregnancy.



EFFECTIVENESS: PIND = 3 – 0,3

### side effects

- complete disruption of the menstrual bleeding pattern leading to a high incidence of amenorrhoea
- ↑ **appetite, non-cyclic weight gain**
- risk of osteoporosis
- Increased risk of STDs and HIV  
(immunosuppressive steroids)

## VI.1.b. Progestogen-only pills (POPs),

sometimes called 'minipills' first licensed in 1973.

### 75 micrograms of Desogestrel (Cerazette)



- The prevalence of POP use is much lower than for combined oral contraceptive pills. Europe < 6%, USA < 1%.

What are the main disadvantages of the POPs?

- Do not reliably inhibit ovulation: occurs in 40% of cycles
  - the need for very careful compliance.
- high incidence of irregular vaginal bleeding

## VI.1.b. Progestogen-only pills (POPs)

### Indications

- women who have contraindications to estrogen **(including breastfeeding)**.
- women in the perimenopause who are perceived to be at lower risk of pregnancy.



### Side effects

- Ectopic pregnancy
- Irregular bleeding, spotting
- Persistent follicles

EFFECTIVENESS: PIND = 8 – 0,3





## **IV. HORMONAL CONTRACEPTION :**

### **IV.2. hormonal combined (estrogen-progestogen) contraception**



**Depending on the route of administration it is divided into:**

**VI.2.a. ORAL CONTRACEPTION COMPOSITION PILL**

**VI.2.b. TRANSDERMAL CONTRACEPTIVE PATCH /Evra/**

**VI.2.c. VAGINAL CONTRACEPTIVE RING /Nuva Ring/**



## **VI.2a. ORAL CONTRACEPTION COMPOSITION**

- **most widely used and successful method of reversible contraception worldwide**
- **first available: 1960**



# ORAL CONTRACEPTION COMPOSITION

- **Ethinyl estradiol**
  - Ethinyl group at 17 position, makes it active orally
  - Inhibits FSH
    - Prevents selection of dominant follicle
- **Progestin**
  - Inhibit LH
  - Thicken cervical mucus
  - Thin endometrium



# ORAL CONTRACEPTION COMPOSITION

- **Singlephasic Combination OCP's** - types and doses of E and P remain constant x 21 days or x 24 days.
  - 21 packs – all active tablets
  - 28 packs - 7 inert or 7 iron tablets
  - 28 packs – 4 inert or 24 active tablets
- **Biphasic/triphasic OCP's** - doses of E and P component change in an attempt to duplicate the pattern of the ovulatory menstrual cycle.



# ORAL CONTRACEPTION COMPOSITION

## Indications

- Contraception
  - Rapidly reversible, safe, effective
- Treatment of endometriosis
  - Continuous usage, no withdrawal periods
- Treatment of abnormal uterine bleeding
  - Most pills reduce menstrual flow and duration
  - Progestins help regulate anovulatory cycles
- Dysmenorrhea



# ORAL CONTRACEPTION COMPOSITION

## Indications-continued

- Recurrent ovarian cysts
  - May prevent functional cyst formation by inhibition of ovulation
  - Do not likely treat existing cysts
  - Low dose and triphasic formulations less protective
- Acne and hirsutism
  - Decrease circulating androgens
    - SHBG increases, free testosterone decreases



# ORAL CONTRACEPTION COMPOSITION

## Non-contraceptive Health Benefits

- Decreases menstrual flow by 60%
- Decrease in menstrual pain
- Decrease in functional cysts by 80-90%
- Prevention of ovarian cancer
  - Risk reduction in women with and without family history of ovarian cancer
  - Up to 80 % reduction in risk with 12 or more years of use





# ORAL CONTRACEPTION COMPOSITION

## Non-contraceptive Health Benefits - continued

- Prevention of endometrial cancer
  - 60% reduction in risk with 4 or more years of use
  
- Reduction in premenstrual symptoms
  - Cyclic headaches
  - Cyclic mood changes



# ORAL CONTRACEPTION COMPOSITION

## Adverse Effects

- Cardiovascular disease
  - MI (1 in 100,000 users)
  - Stroke (3 in 100,000 users)
  - DVT/PE (11 in 100,000 users)
- Hypertension
  - Likely little effect of OC's on HTN
  - Use caution in those with established HTN



# ORAL CONTRACEPTION COMPOSITION

## Adverse Effects

- Glucose tolerance
  - Not affected in lower dose OC use
- Gallbladder disease
  - May increase risk of disease for susceptible women
- Hepatic adenomas
  - Risk low, lower with low dose OCs



# ORAL CONTRACEPTION COMPOSITION

## Adverse Effects

- Breast Cancer
  - Current users may have increase in risk
  - Attributable risk is 0.001% (1/1000)
  - Risk reduced to baseline after discontinuing
  - Studies vary on whether there really is an increased risk at all



## ORAL CONTRACEPTION CNINDX

- DVT / PE / hypercoagulable state (major surgery requiring prolonged bed rest)
- untreated HTN
- DM > 20 years duration or with established microvascular disease
- breast cancer
- pregnancy
- undiagnosed vaginal bleeding
- H/O migraine HA with focal neurologic symptoms
- > 35, smoker
- liver disease (hepatitis, cirrhosis, cancer)



# ORAL CONTRACEPTION PRECAUTIONS

- **active GB disease**
- **OCP- induced or pregnancy cholestasis**
- **H/O breast cancer,**
- **< 4 weeks postpartum**
- **lactation**
- **use of - anticonvulsants, rifampicin, rifabutin, griseofulvin**



# **ORAL CONTRACEPTION SIDE EFFECTS**

- **OC side effects occur when hormone activity is  $>$  or  $<$  effect of woman's own hormones.**
- **SE of hormone excess resemble symptoms and physiologic changes of pregnancy.**
- **SE of hormone deficiency parallel symptoms and changes of peri- and postmenopausal period.**



## **ORAL CONTRACEPTION MANAGING SIDE EFFECTS ESTROGEN EXCESS**

- **↑ cystic breast changes / breast size**
- **uterine/fibroid enlargement**
- **capillary fragility/telangiectasias**
- **thromboembolic disease**
- **dysmenorrhea**
- **hypermenorrhea**





## **ORAL CONTRACEPTION MANAGING SIDE EFFECTS PROGESTIN EXCESS**

- **cervicitis**
- **↑ appetite, non-cyclic weight gain**
- **depression**
- **fatigue**
- **↓ libido**
- **HTN**
- **leg vein dilation**
- **neurodermatitis**



## **ORAL CONTRACEPTION MANAGING SIDE EFFECTS ESTROGEN DEFICIENCY**

- **absent withdrawal bleeding**
- **bleeding/spotting day 1 to 9**
- **continuous bleeding/spotting**
- **hypomenorrhea**
- **atrophic vaginitis**
- **pelvic relaxation**
- **vasomotor symptoms**



## **ORAL CONTRACEPTION MANAGING SIDE EFFECTS PROGESTIN DEFICIENCY**

- **breakthrough bleeding and spotting days 10 to 21**
- **delayed withdrawal bleeding**
- **dysmenorrhea (also E2 excess)**
- **heavy flow and clots (also E2 excess)**



# **THERE IS NO PERFECT PILL WHICH FITS ALL WOMEN**

- **DRUG MUST BE ADJUSTED (TAILORED) TO A PARTICULAR INDIVIDUAL WOMAN BY EXPERIENCED PHYSICIAN:**
- **EFFECTIVENESS: PIND = 8 – 0,3**



## VI.2.b. TRANSDERMAL CONTRACEPTIVE PATCH /Evra/

- Ethinyl estradiol/norelgestromin
- Patch worn weekly for three weeks, off for one week
- 99% effective as contraceptive
- Dec 2005: FDA Warning regarding increased exposure to estrogen
  - 60% higher than for OC Pills
    - This could explain the increased risk of (VTE) in patch users compared to users of combined Pills.



## VI.2.b. TRANSDERMAL CONTRACEPTIVE PATCH /Evra/

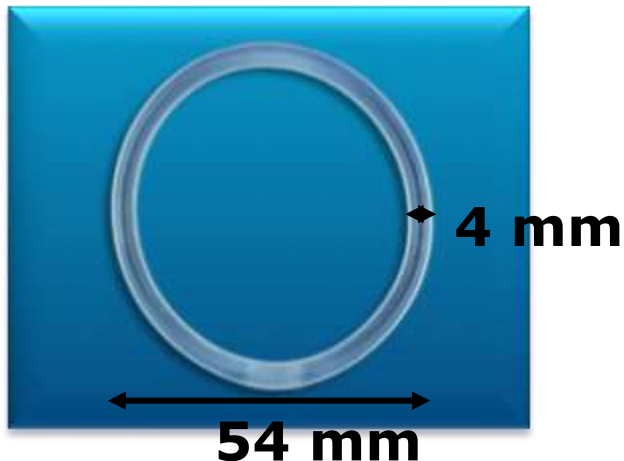
- Sustained drug delivery reduces the need for frequent self-administration, and thus may improve patient compliance.
- The nonoral route of administration is useful for patients who have difficulty swallowing pills.
- **EFFECTIVENESS: PIND = 6 – 0,3**

## VI.2.c. VAGINAL CONTRACEPTIVE RING

/NuvaRing/

What's this?

- A small, thin, transparent, flexible ring woman put herself in vagina once a month for three weeks.



•EFFECTIVENESS: PIND = 7 – 0,3



## Mirena – Intrauterine hormonal system

- Dosing:
  - 5 years (actually effective for 7 years)
- Potential side effects:
  - breakthrough bleeding if first 3-6 months, then hypo or amenorrhea
- Advantages:
  - no estrogen, easy to use, long-acting, may see amenorrhea, decrease in: menstrual blood loss
  - usefull in treatment of endometrial hyperplasia and/or uterine fibroids.

•**EFFECTIVENESS: PIND = 0.1 – 0.1**







# Emergency Contraception- EC

## Indications for Use:

- Sexual assault
- Lack of contraceptive use during coitus
- Mechanical failure of male condom (breakage, slippage, or leakage)
- Incorrect use of diaphragm, cervical cap, or female condom
- Failure of spermicide tablet or film to melt before intercourse
- Error in practicing withdrawal (coitus interruptus)
- Missed combined oral contraceptives (any two consecutive pills)
- Missed progestin-only oral contraceptives (one or more)
- Expulsion or partial expulsion of an intrauterine device
- Exposure to potential teratogen while not using effective contraception
- Late injection of injectable contraceptive (> 2 weeks late for progestin-only formulation or > 3 days late for a combined estrogen plus progestin formulation)



## Methods of EC available:

- 1). progestin-only pills ( Escapelle 72h)
- 2). Combined OC pills (OCPs) (72h)
- 3). Intrauterine device (Cooper IUD) (120h)



## Progestin-only pills ( 1500 mcg required)

**Postinor.** 750 mcg/tabl -1st pill ASAP and after 12h second pill)

**Escapelle.** 1500 mcg/tabl

Only 1 pill ASAP





## Combined OC pills (OCPs) **"Yuzpee,, method.**

Ordinary birth control pills containing etynyloestradiol and levonorgestrel)

**The number of pills for the 1st and second dose depends on the drug.**

**Gravistat 250** : 1st dose - 2 pills , second dose after 12 h - 2 pills

**Gravistat 125** : 1st dose - 4 pills , second dose after 12 h - 2 pills

**Minisiston** : 1st dose - 4 pills , second dose after 12 h - 2 pills

**Microgynon** : 1st dose - 4 pills , second dose after 12 h - 2 pills

**Rigevidon** : 1st dose - 4 pills , second dose after 12 h - 2 pills

**Stedril 30** : 1st dose - 4 pills , second dose after 12 h - 2 pills