

# Controlling Fertility

## Control of Fertility

- ▶ Fertility can be controlled by a variety of hormonal and non-hormonal methods
- ▶ **Contraceptive methods** aim to **prevent** fertilization and pregnancy, and include the use of hormones (**oestrogen and progesterone**) as well as non-hormonal methods (such as the use of barriers or surgery)
- ▶ Hormones can also be used to **increase** the chance of pregnancy occurring when it previously might not have done
- ▶ Humans can use **barrier, chemical, surgical** and **natural** contraceptive methods to prevent a pregnancy
- ▶ Some birth control methods also give protection from **sexually transmitted infections**

## Hormonal Method to control fertility

1. **Oral contraceptives** that contain hormones to inhibit FSH production so that no eggs mature; there are two types:
  - a. The combined pill contains **oestrogen** and **progesterone** which is over 99% effective at preventing pregnancy
  - b. **High** levels of **oestrogen** inhibit FSH production **preventing** the **maturation** and release of eggs
  - c. **Progesterone** also plays a role in inhibiting the release of mature eggs and stimulates the production of a **thick mucus** which prevents sperm from reaching any eggs that are released
- ▶ There is also the progesterone-only pill which has fewer side effects
2. **Injection, implant or skin patch** of slow-release **progesterone** to inhibit the maturation and release of eggs for a number of months or years
- ▶ Benefits of implants reduce the chance of someone forgetting to take the pill (which should be taken at the same time every day to be most effective)

## **B5: Homeostasis and**

### **Response**

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- ▶ **Intrauterine devices (IUD)** which prevent the implantation of an embryo or release a hormone; there are two types
- ▶ A **plastic IUD** produces progesterone which stimulates the production of a thick mucus lining preventing sperm from reaching any eggs
- ▶ A **copper IUD** works by releasing low levels of copper ions which disable sperm cells

## **Non- Hormonal Method to control fertility**

There are 3 main method to control fertility

1. Barrier
2. Natural
3. Surgical

### **1. Barrier**

- ▶ Barrier methods such as condoms and diaphragms prevent the sperm from reaching an egg
- ▶ **Condoms** are the only barrier method that can prevent the spread of sexually transmitted infections
- ▶ **Spermicidal agents** which kill or disable sperm – these are only **70 - 80%** effective

### **2. Natural**

- ▶ **Abstaining** from intercourse when an egg may be in the oviduct. Complete abstinence is the only 100% effective method at preventing pregnancy
- ▶ **Natural methods** involve avoiding intercourse during the most fertile part of the menstrual cycle but they are not highly effective as fertility cannot be accurately predicted

### **3. Surgical**

- ▶ **Surgical methods of male and female sterilization**
  - a. **In a female**, the oviducts which connect the ovaries to the uterus (also called the fallopian tubes) can be cut and tied

## B5: Homeostasis and Response

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b. **In a male**, the sperm ducts (the tube connecting the testes to the penis) can also be cut and tied in a procedure called a vasectomy

- Both methods are highly effective but there have been a small number of cases where tubes have rejoined

### GUIDE TO DIFFERENT TYPES OF CONTRACEPTION



#### COMBINED PILL

- Hormonal
- 99% effective when used perfectly
- Remember to take it daily
- Can choose to have regular periods or skip them



#### PROGESTOGEN-ONLY PILL

- Hormonal
- 99% effective when used perfectly
- Remember to take it at the same time every day
- Periods can become lighter or stop



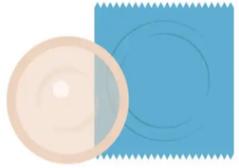
#### PATCH

- Hormonal
- 99% effective when used perfectly
- Remember to change it weekly
- Can choose to have regular periods or skip them



#### RING

- Hormonal
- 99% effective when used perfectly
- Remember to change it every 3 weeks
- Can choose to have regular periods or skip them



#### MALE CONDOMS

- No hormones
- 98% effective when used perfectly
- Remember to use every time you have sex
- Protection against STIs



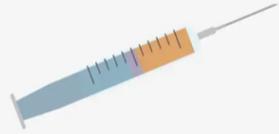
#### FEMALE CONDOMS

- No hormones
- 95% effective when used perfectly
- Remember to use every time you have sex
- Protection against STIs



#### IMPLANT

- Hormonal
- Over 99% effective
- Works for 3 years
- Periods may be lighter or stop



#### INJECTION

- Hormonal
- Over 99% effective
- Works for 13 weeks
- Periods may be lighter or stop



#### DIAPHRAGMS AND CAPS

- No hormones
- 92-96% effective when used perfectly and with spermicide
- Remember to use every time you have sex



#### IUD (NON-HORMONAL COIL)

- No hormones
- Over 99% effective
- Works for 5-10 years
- Periods can become heavier



#### IUS (HORMONAL COIL)

- Hormones
- Over 99% effective
- Works for 3-5 years
- Periods may be lighter or stop

## **Increase in Fertility**

- Infertility occurs when a couple find it difficult or are unable to conceive naturally
- This can be a result of insufficient or too low levels of reproductive hormones affecting the development of egg and sperm cells, or as a result of issues with the reproductive system of the female

### **Use of Hormones to increase Fertility**

- **Artificial hormones** are used as part of modern reproductive technologies to treat infertility, particularly when the female is not producing enough eggs, usually as a result of the pituitary gland not producing sufficient FSH to cause egg maturation
- The **hormones FSH and LH** are given as a ‘fertility drug’ to stimulate egg production
- **Note:** several eggs can be released at once so this increases the chance of multiple births (twins or triplets etc)
- It also doesn’t have a particularly high success rate and can be expensive

### **IVF treatment**

- An alternative treatment is for eggs to be fertilized by sperm outside of the body (*in vitro* means ‘in glass’) – this is used particularly when there are issues with both male and female fertility
- The process involves:
  1. Giving a mother **FSH and LH** to stimulate the maturation of several eggs
  2. The eggs are collected from the mother and fertilized by sperm from the father in the laboratory
  3. The fertilized eggs develop into **embryos**
  4. At the stage when they are tiny balls of cells, one or two embryos are inserted into the mother’s uterus (womb)
- The **success rate of IVF is low (~30%)** but there have been many improvements and advancements in medical technologies which are helping to increase the success rate
- These **advancements include improvements** in microscope techniques and micro-tools that enable single cells to be removed from an embryo for genetic testing to identify if the embryo is healthy or has genetic defaults

## **Issues with Fertility Treatments**

- Fertility treatments can give a couple the chance to have a baby of their own, which is a big positive
- Potential issues include:
  1. As several embryos are implanted, the risk of **multiple births** is quite high (which increases the risk of miscarriage or stillbirths)
  2. The **success rate** is not very high (although it is increasing); IVF treatment failures can be very emotionally upsetting and physically stressful for couples.
  3. Some women use IVF to get pregnant at a **later age** than they would be able to conceive naturally
  4. Some people are against IVF as more embryos can be produced than are used. These unused embryos are destroyed which is unethical.
  5. The use of **genetic testing** is controversial as there is potential it could be misused in choosing characteristics of offspring which is not allowed.

