

# Biology of controlling fertility

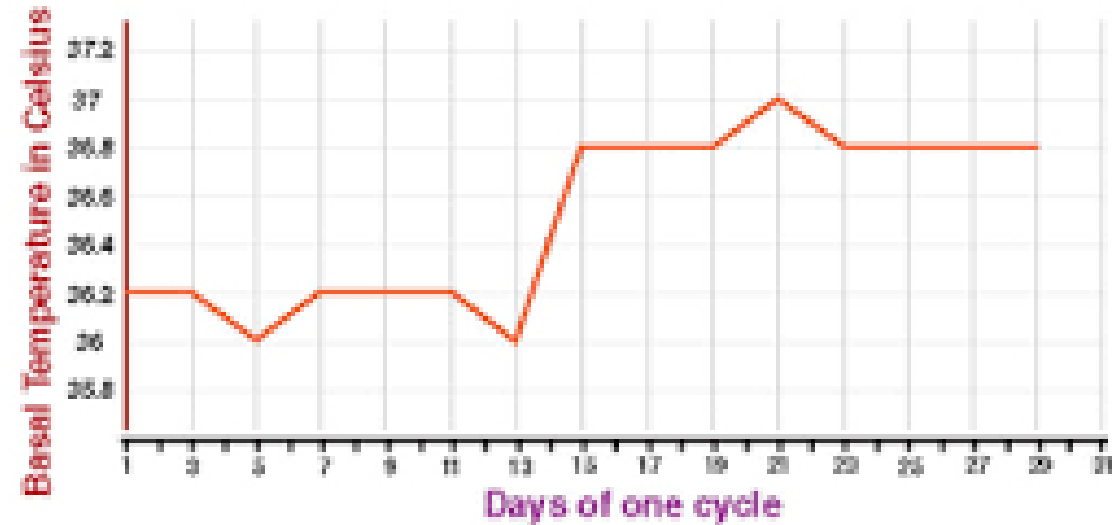


## I can compare continuous v cyclical fertility

- The negative feedback effect of testosterone maintains relatively constant levels of FSH and ICSH in the bloodstream.
- **Male** fertility is **continuous**. They secrete a steady level of testosterone and produce a steady quantity of sperm.
- **Female** fertility is **cyclical** due to the delicate balance of pituitary and ovarian hormones. Females are usually only fertile for 1-2 days immediately after ovulation.

# I can describe indicators of the fertile period.

- **Body temperature** rises by 0.2-0.5°C at ovulation and stays high during the luteal phase.
- **Cervical mucus** becomes thin and watery.
- Changes in viscosity of cervical mucus & body temperature are used by some people as indicators for the rhythm method of birth control.



# I can describe causes of infertility

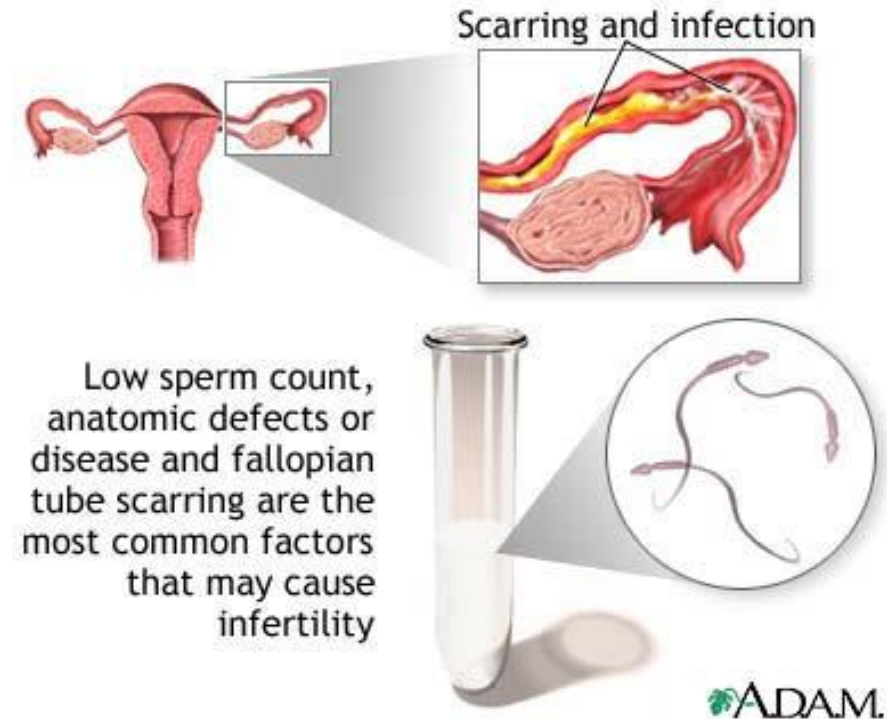
Infertility could be due to one or a combination of factors. Infertility is usually treated by returning hormones to the natural level.

## Infertility in Females

- failure to ovulate
- blockage of oviduct(s)
- failure of implantation

## Infertility in Males

- low sperm count



# I can describe treatments for infertility

## Stimulating ovulation

- (a) by drugs that prevent the negative feedback effect of oestrogen on FSH secretion or
- (b) using drugs that mimic the action of FSH and LH.
- These drugs can cause super ovulation that can result in multiple births or be used to collect ova for in vitro fertilisation (IVF) programmes.

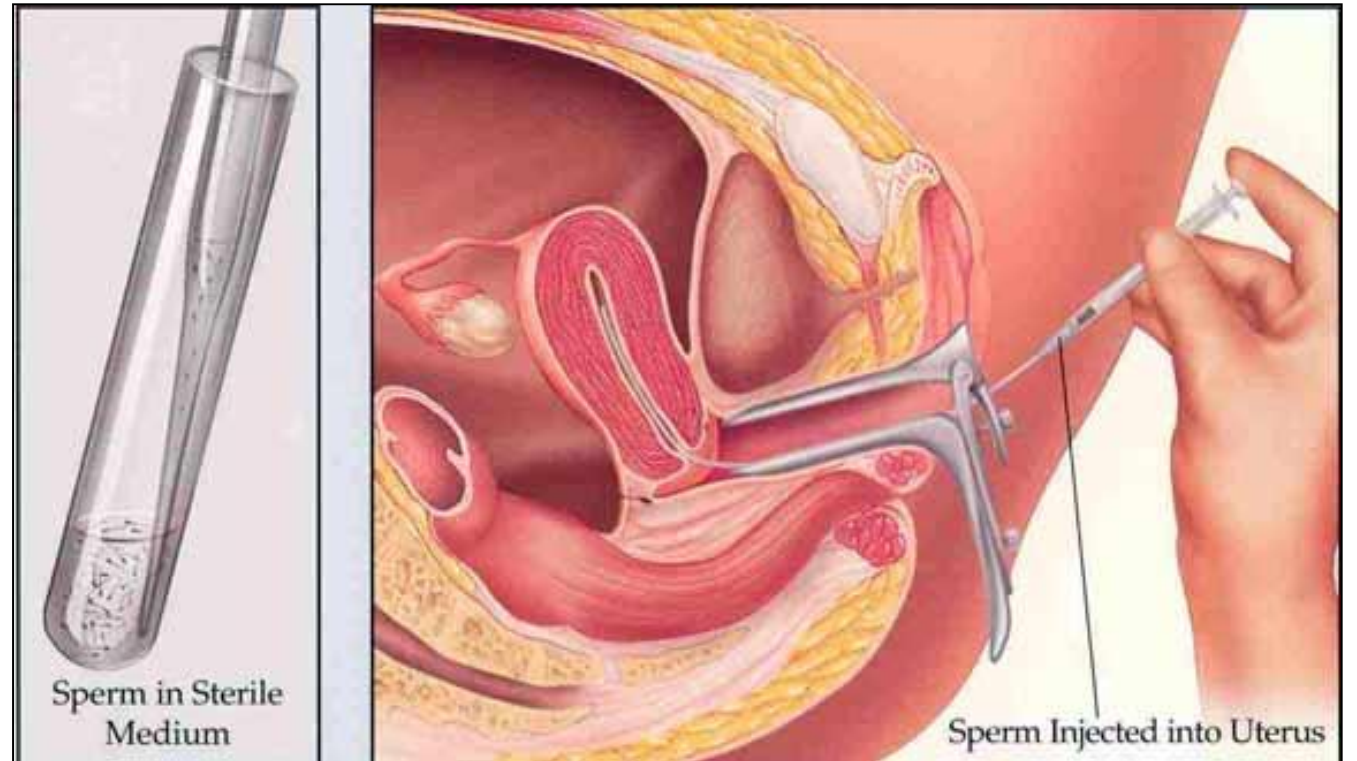


# I can describe treatments for infertility

## Artificial insemination-

Several samples of semen are collected over a period of time. Artificial insemination is useful where the male has a low sperm count.

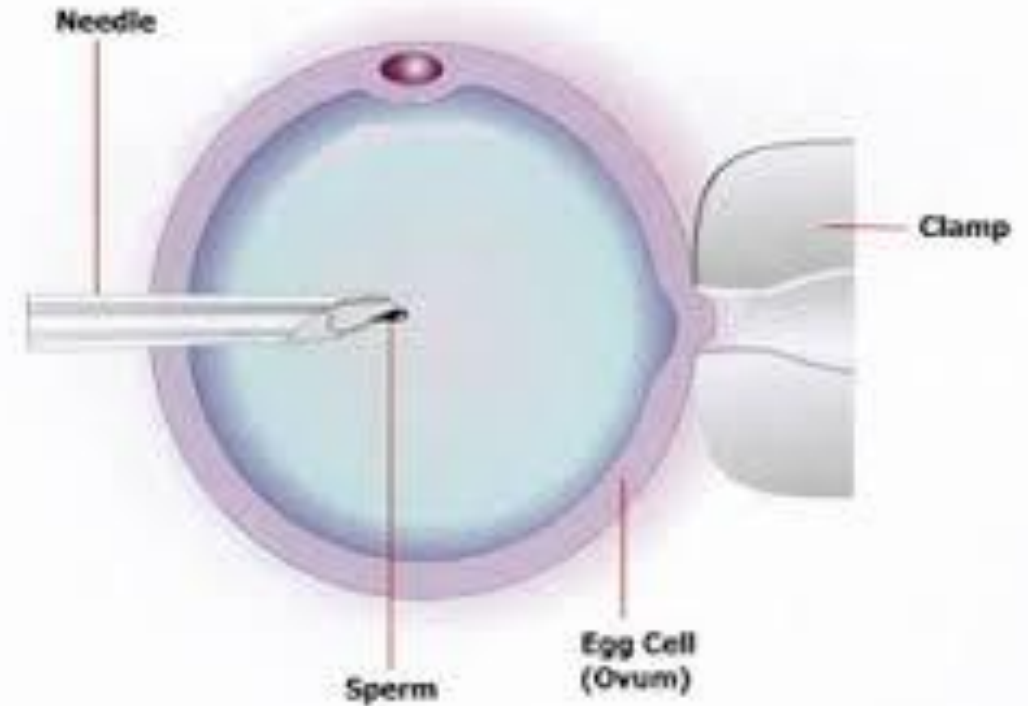
If a partner is sterile a donor is used.



# I can describe treatments for infertility

- Intra-cytoplasmic sperm injection (ICSI) -
- If mature sperm are defective or very low in number ICSI can be used. The head of the sperm is drawn into a needle and injected directly into the egg to achieve fertilisation.

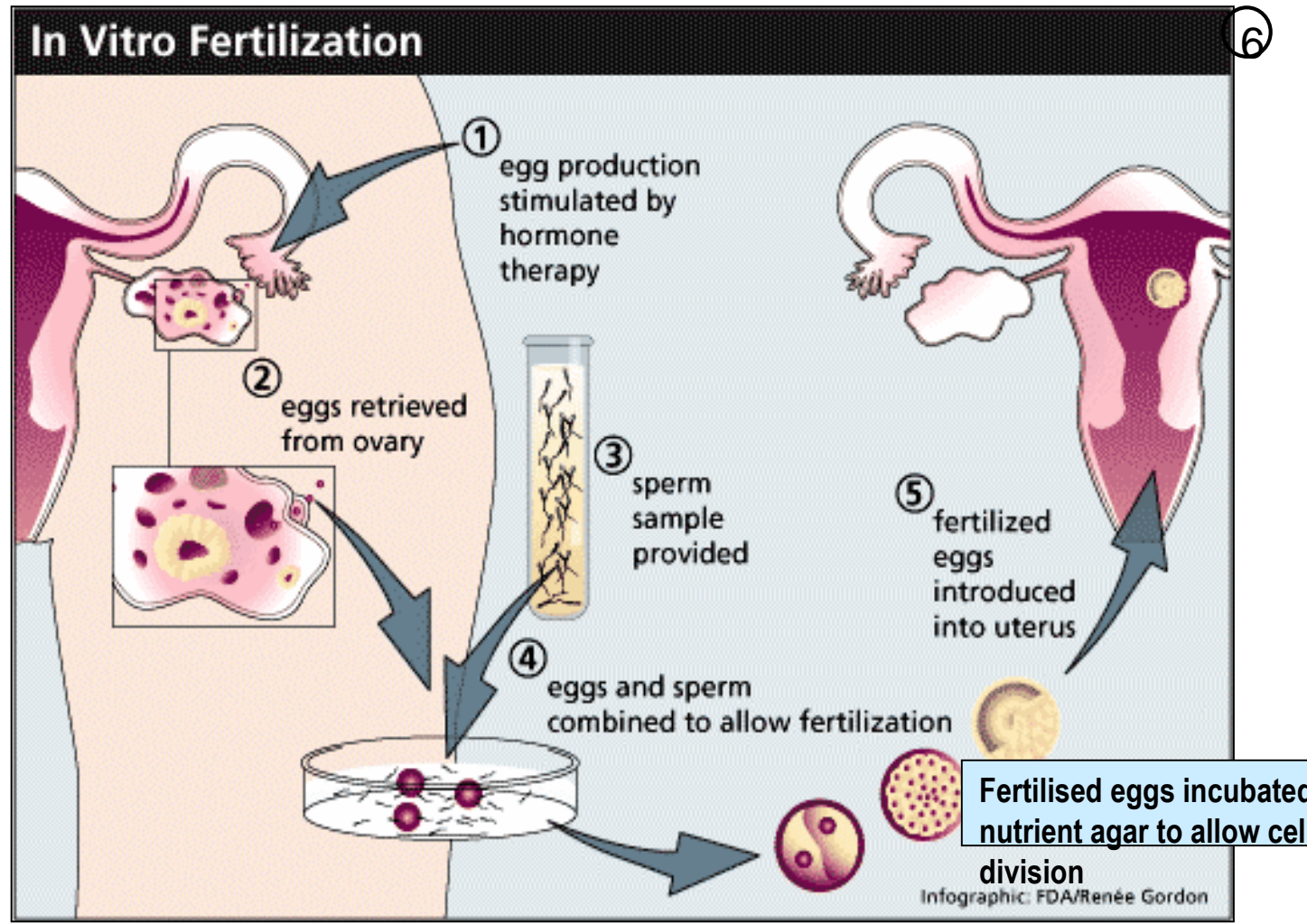
Intra Cytoplasmic Sperm Injection (ICSI)



# I can describe treatments for infertility

## In vitro fertilisation (IVF)

- surgical removal of the eggs from ovaries after hormone stimulation. The eggs are mixed with sperm in a culture dish. The fertilised eggs (zygotes) are incubated until they have formed at least eight cells and are then transferred into the uterus for implantation.

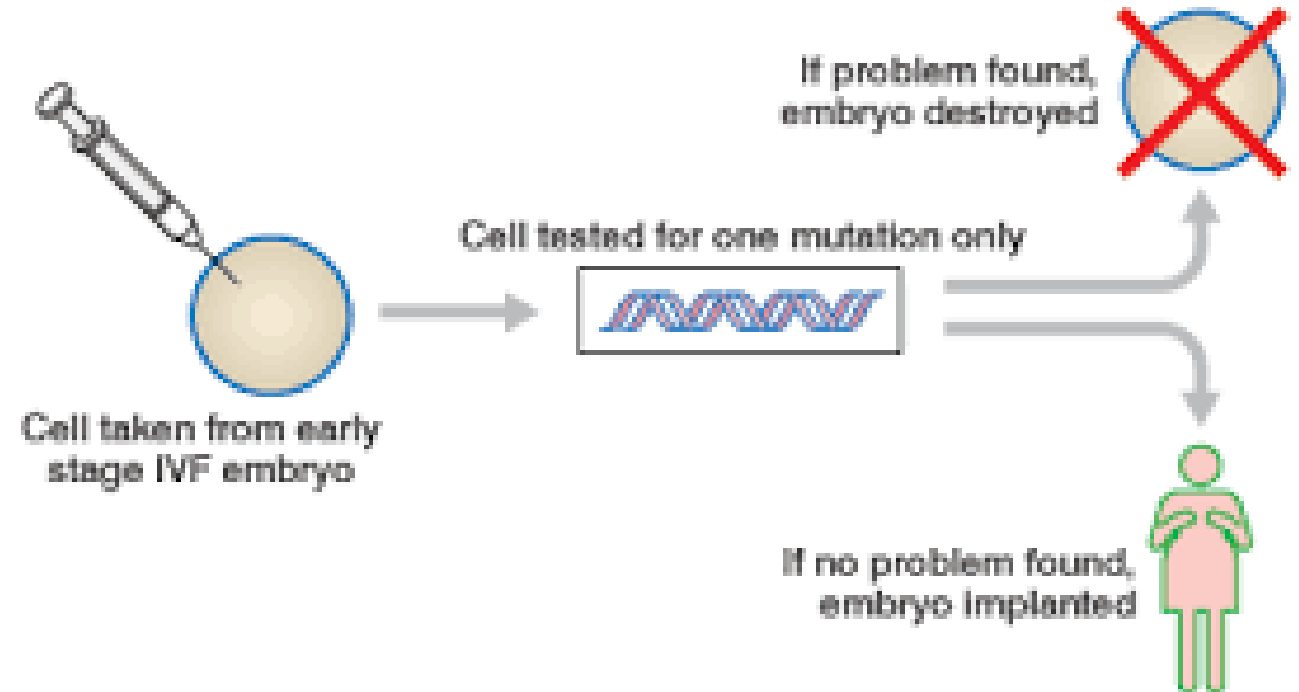




# I can discuss PGD

- Prior to implantation checks can be carried out. **Pre-implantation genetic diagnosis (PGD)** is used to identify single gene disorders and chromosomal abnormalities.
- Ethical issues arise from this.
- Should we interfere with conception??
- If you are a carrier for a genetic disease ??

## ESTABLISHED EMBRYO TEST: PRE-IMPLANTATION GENETIC DIAGNOSIS



## I can discuss contraception

**Contraception** is the intentional prevention of conception by natural or artificial means.

### Rhythm methods

Women can use temperature and cervical mucus to calculate the fertile period.

This is useful:

for couples who are trying to conceive and want to know when sexual intercourse is likely to be most successful

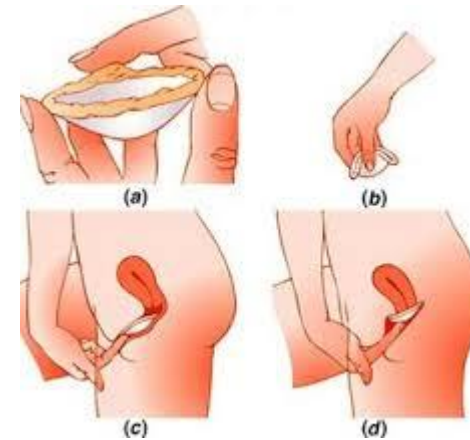
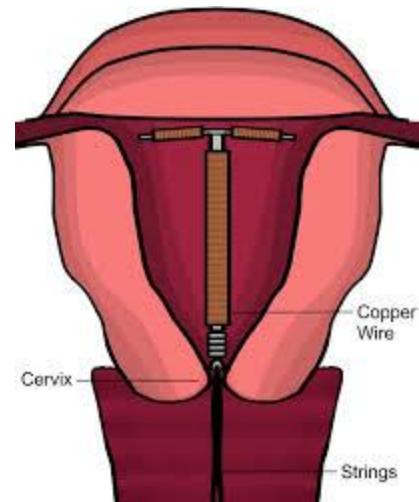
as a natural method of contraception - by avoiding sexual intercourse when the female is fertile.

This method is unreliable!

# I can discuss physical methods of contraception

## Physical methods

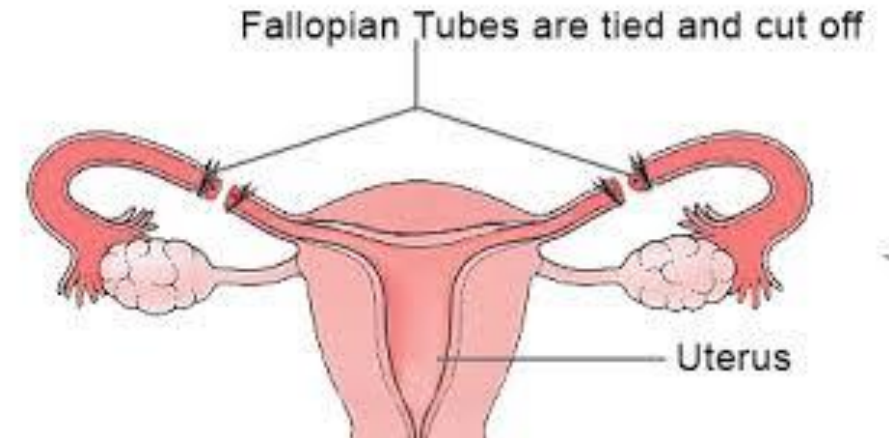
- **barrier methods** e.g. use of condoms, diaphragm, cervical cap block the ability of sperm to reach ovum.
- **Intra uterine devices (IUD)** prevent implantation of embryo in endometrium.



# I can discuss physical methods of contraception

## Physical methods

- **Sterilisation procedures - vasectomy** in men involves cutting & tying the sperm ducts preventing sperm release.
- **Tubal ligation** in females involves cutting & tying oviducts preventing ova meeting sperm.
- **Avoiding intercourse during fertile periods.**



# I can discuss chemical methods of contraception

## Chemical methods

- Chemical contraceptives are based on combinations of **synthetic hormones** (synthetic progesterone combined with synthetic oestrogen) that mimic negative feedback preventing the release of FSH and LH.
- **Morning-after pills** contain higher doses of progesterone & oestrogen to prevent implantation.
- **Mini-pills** contain progesterone only and cause thickening of cervical mucus, reducing viability of sperm and access to uterus.

