The use of hormones to treat infertility (HT only)

4.5.3.5 · Biology · revision notes

How FSH and LH are used as fertility drugs and in IVF, and the benefits, risks and ethical issues of these treatments. This is Higher tier content: expect 'describe the stages of IVF' questions and 'evaluate' questions from the point of view of patients and doctors.

Key facts

- Fertility drug: FSH + LH → eggs mature and are released → pregnancy in the normal way
- In vitro = outside the body
- Problems: stressful, success rates not high, multiple births
- IVF: FSH + LH → several eggs mature → collected → fertilised in the lab → embryos → 1 or 2 inserted into the uterus
- Only 1 or 2 embryos inserted, to reduce the risk of multiple births
- Ethics: unused embryos, cost, religious objections

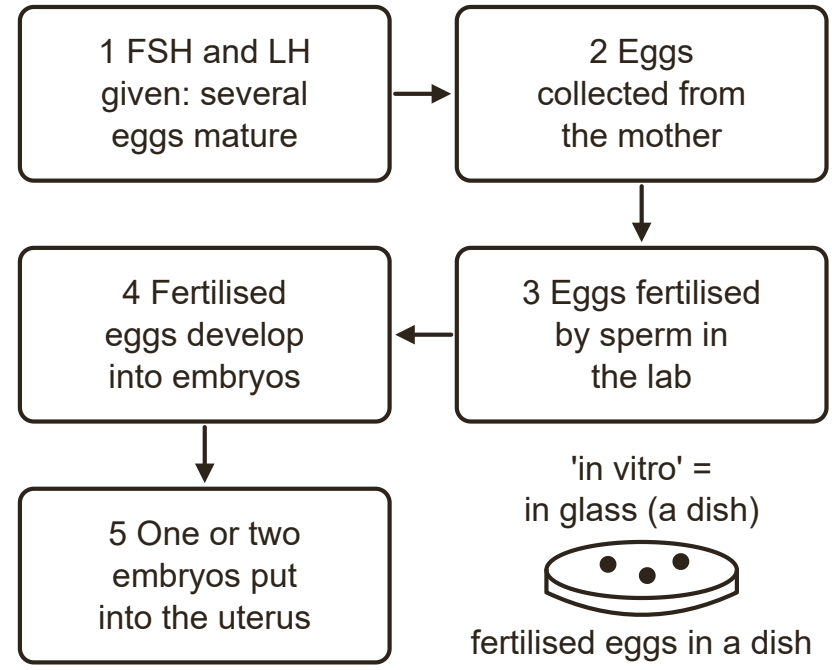
Notes

Fertility drugs

- Some women cannot get pregnant because their eggs do not mature or are not released.
- A **'fertility drug'** containing **FSH and LH** can be given. FSH makes eggs mature and LH stimulates their release.
- The woman may then become pregnant in the **normal way**.

IVF (in vitro fertilisation)

- 1. The mother is given **FSH and LH** to stimulate the **maturation of several eggs**.
- 2. The eggs are **collected** from the mother.
- 3. The eggs are **fertilised by sperm** from the father **in the laboratory**.
- 4. The fertilised eggs divide by mitosis and develop into **embryos**.
- 5. When the embryos are tiny **balls of cells**, **one or two** are inserted into the mother's **uterus** (womb).



The five steps of IVF.

- 'In vitro' means 'in glass': fertilisation happens outside the body.
- Developments in **microscopy** allowed IVF to develop: microscopes are used to check eggs and sperm, guide a sperm into an egg and check that embryos are developing.

Benefits, problems and ethics

- Fertility treatment gives a woman the chance to have a baby of her own.
- But it is very **emotionally and physically stressful**, and the **success rates are not high**.
- It can lead to **multiple births**, which are a risk to both the babies and the mother. This is why only one or two embryos are inserted.
- Ethical issues: unused embryos may be destroyed; treatment is expensive and may not be available to everyone; some people object on religious grounds.

How to answer each type of question

Describe the stages of IVF

4 to 5 marks | Grade 6

1. Start with the hormones and what they do.
2. Then collection, fertilisation in the lab, and embryo development.
3. Finish with one or two embryos inserted into the uterus.

Example. Describe how IVF can be used to help a couple have a baby.

Model answer. The woman is given FSH and LH (1) so that several eggs mature (1). The eggs are collected and fertilised with the man's sperm in a laboratory (1). The fertilised eggs develop into embryos (1). When they are tiny balls of cells, one or two embryos are inserted into the woman's uterus (1).

Explain why hormones are used

2 marks | Grade 7

1. Say what FSH and LH do: stimulate several eggs to mature.
2. Say why that helps: more eggs to fertilise, so a better chance of a healthy embryo.

Example. Explain why a woman having IVF is given FSH and LH before her eggs are collected.

Model answer. To stimulate the maturation of several eggs (1), so that more eggs can be collected and fertilised, increasing the chance of getting a healthy embryo / a pregnancy (1).

Evaluate a fertility treatment decision

4 marks | Grade 8

1. Give the benefit for the patient (chance of a baby).
2. Give the risks (multiple births, stress, cost) and any ethical issues.
3. Consider the doctor's view (success rates, health of mother and babies).
4. Finish with a justified conclusion.

Example. During IVF, a doctor must decide how many embryos to insert into the patient's uterus. Evaluate inserting two embryos rather than one.

Model answer.

Any three from:

two embryos increase the chance that at least one will implant, so pregnancy is more likely (1)

this matters because success rates are not high and each cycle is stressful and expensive (1)

but two embryos increase the chance of twins (1)

multiple births are a risk to the babies and to the mother (1)

plus a justified conclusion, e.g. one embryo is safer, but two may be justified if earlier attempts have failed (1)

Don’t lose marks

- Saying fertilisation happens inside the woman in IVF. It happens in the laboratory; only the embryos are put back.
- Saying fertility drugs contain oestrogen or progesterone. They contain FSH and LH.
- Saying lots of embryos are inserted to raise the chance of success. Only one or two are, because multiple births are risky.
- Giving only biological facts in 'evaluate' questions, with no ethical or personal points and no conclusion.

More tips

Memory tricks

- IVF in five words: stimulate, collect, fertilise, grow, insert.
- Fertility drug = FSH + LH, pregnancy the normal way. IVF = FSH + LH, fertilisation in the lab.
- Three problems: stress, low success rate, several babies at once.

Exam technique

- Learn the IVF stages in order: each stage is usually worth a mark.
- For 'evaluate', think about the patient (chance of a baby, stress, cost, multiple births) and the doctor (success rates, health risks, ethics).
- Always say what FSH and LH do, not just their names.

What each grade needs

What you need to be able to do, from the first marks up to the top grade.

Grade 5 — **Name the hormones in fertility drugs**
FSH and LH.

Grade 5 — **Describe how a fertility drug works**
FSH and LH make eggs mature and be released, so the woman may become pregnant in the normal way.

Grade 6 — **Describe the main stages of IVF**
Give FSH and LH, collect eggs, fertilise them in the lab, then insert one or two embryos.

Grade 7 — **Give the disadvantages of fertility treatment**
It is emotionally and physically stressful, success rates are not high, and multiple births are risky.

Grade 8 — **Evaluate IVF from different points of view**
Weigh benefits against risks for patients and doctors, including ethical issues such as unused embryos.

Free notes, Full packs, practice papers and mock exams at chhetriacademy.com. Written for this site; not taken from past papers. Stuck? 1-to-1 tutoring with a free 30-minute trial lesson.