

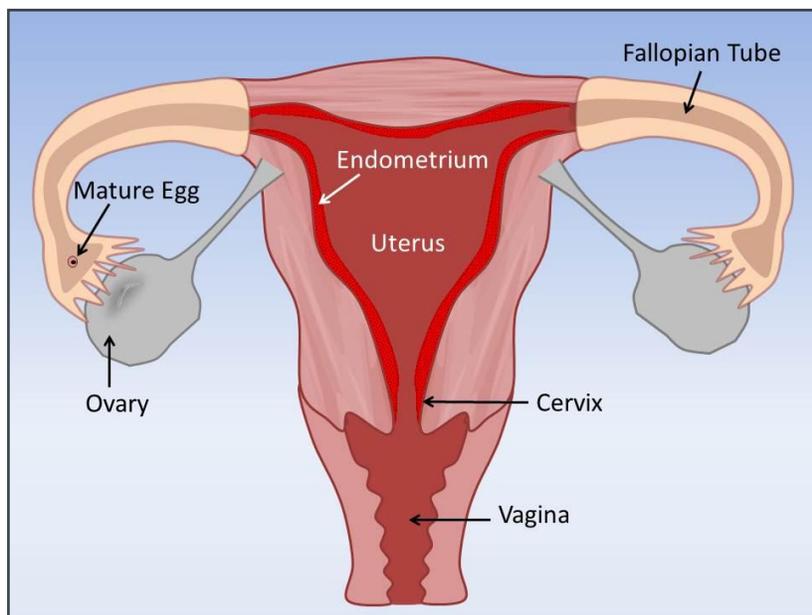
The Menstrual Cycle, Hormones and Fertility Treatment

How many of us understand how our monthly cycle works?

Every 28 days (or thereabouts), between the ages of around 13 and 51, a woman will release a mature egg from her ovary which has the potential to be fertilised and develop into an embryo. If fertilisation does not occur, then the mature egg, along with spongy lining of the womb which developed to protect and nourish the developing embryo, is lost through the menstrual bleed.

This is all information we know, however the hormonal changes that govern our monthly cycle tend to be more of a mystery to us. A distant memory of a biology lesson might tell you that oestrogen, progesterone and FSH all play a role, but what that role is we can't quite remember. This leaflet aims to provide an overview of some of the key processes involved in our menstrual cycle and how these relate to our fertility.

The cycle is often divided into two phases, the follicular phase and the luteal phase. The follicular phase spans from the first day of your period until the day of ovulation, while the luteal phase starts at ovulation and ends the day before your next period. The length of the follicular phase varies from woman to woman, meaning few women have a cycle which lasts exactly 28 days. The luteal phase however is less variable and nearly always lasts 14 days.



Days 1-4

Day one of the menstrual cycle is the first day of your period. Levels of oestrogen and progesterone are low, having dropped quickly at the end of the last cycle.

The low level of oestrogen causes follicle-stimulating hormone (FSH) to be released from a pea-sized gland known as the pituitary gland; which is found at the base of the brain behind the nose. FSH is key when it comes to fertility, because it allows a small group of follicles to grow and develop inside the ovary. Each of these follicles contains an egg, however under normal circumstances only one follicle will be able to fully mature and ovulate on or around day 14.

Days 5-8

As the follicles grow, they begin to produce oestrogen. Increased levels of oestrogen in the blood tell the pituitary gland to stop releasing FSH and so this begins to decline. This is a crucial time for the developing follicles, as this is the point at which one of them will become dominant whilst the others will begin to degenerate and die by a process called atresia. The dominant follicle can usually be detected using ultrasound after day 8. This is the follicle that was at exactly the right size at the right time and was able to respond the best to declining FSH

levels. During IVF treatment, FSH injections are given so that levels of the hormone remain higher for longer. This means that multiple follicles are able to mature at the same time in preparation for egg collection. Occasionally, two follicles will naturally become dominant at the same time, which can result in the conception of non-identical twins.

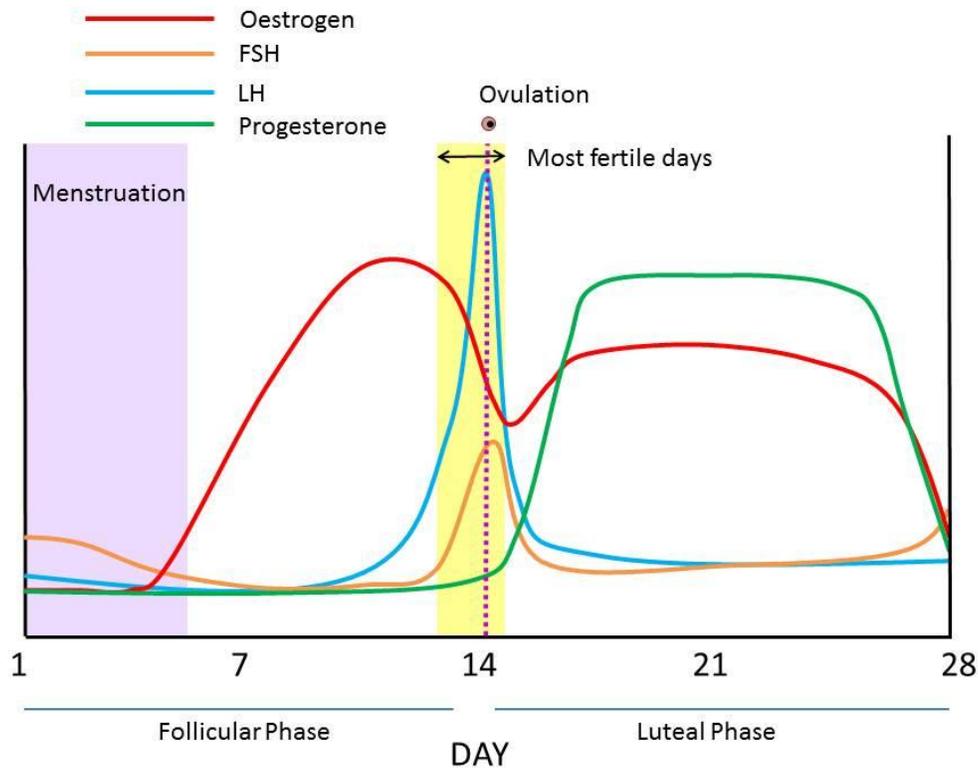
Days 9-13

During this stage, oestrogen levels continue to rise which causes the endometrium (the spongy lining of the uterus) to thicken. Sticky mucus which prevents sperm entering the cervix at other times of the month also becomes thinner. The mucus is now of a consistency to help sperm travel towards the fallopian tubes for fertilisation. High oestrogen triggers the pituitary gland to release a surge of luteinizing hormone or LH, which is responsible for triggering ovulation. There is also another sudden rise in FSH levels, although this is not as dramatic as the increase in LH.

Day 14

On or around day 14, about 36 hours after the LH surge begins, the dominant follicle ruptures on the surface of the ovary and a mature egg is released. The egg is then swept into the adjacent fallopian tube.

Once inside a fallopian tube, an egg is viable for around 24 hours. As sperm can survive for a few days inside the fallopian tubes, the best time to have sex if you're trying to conceive is between the start of the LH surge and ovulation.



Days 15-26

The empty follicle is now known as a corpus luteum. Far from its job being done, the corpus luteum plays a central role in the remainder of the cycle. In fact, if fertilisation is successful, the corpus luteum becomes critical to the early development of embryo.

The corpus luteum releases oestrogen and large amounts of progesterone. Progesterone levels therefore rise for the first time in this cycle. The role of the corpus luteum is to make sure the endometrium is in the perfect condition for implantation of an embryo. The uterine lining therefore continues to get thicker and blood vessels grow through it.

Levels of LH eventually drop below a point that can sustain the corpus luteum. The only way to maintain the corpus luteum is the presence of human chorionic

gonadotropin (hCG), which is a hormone very similar to LH but released from the developing embryo.

Days 27 and 28

Without hCG, the corpus luteum degenerates after 14 days and so the release of oestrogen and progesterone stops. Levels of these hormones therefore drop dramatically. Low levels of oestrogen mean the pituitary gland can once again start releasing FSH, and thus the cycle begins again.

Pregnancy tests detect the presence of hCG in urine. The levels of hCG necessary for a positive result are usually reached around 14 days after fertilisation, so around the same time as your period is due. However, some more sensitive pregnancy tests are now able to detect the presence of hCG several days before this.