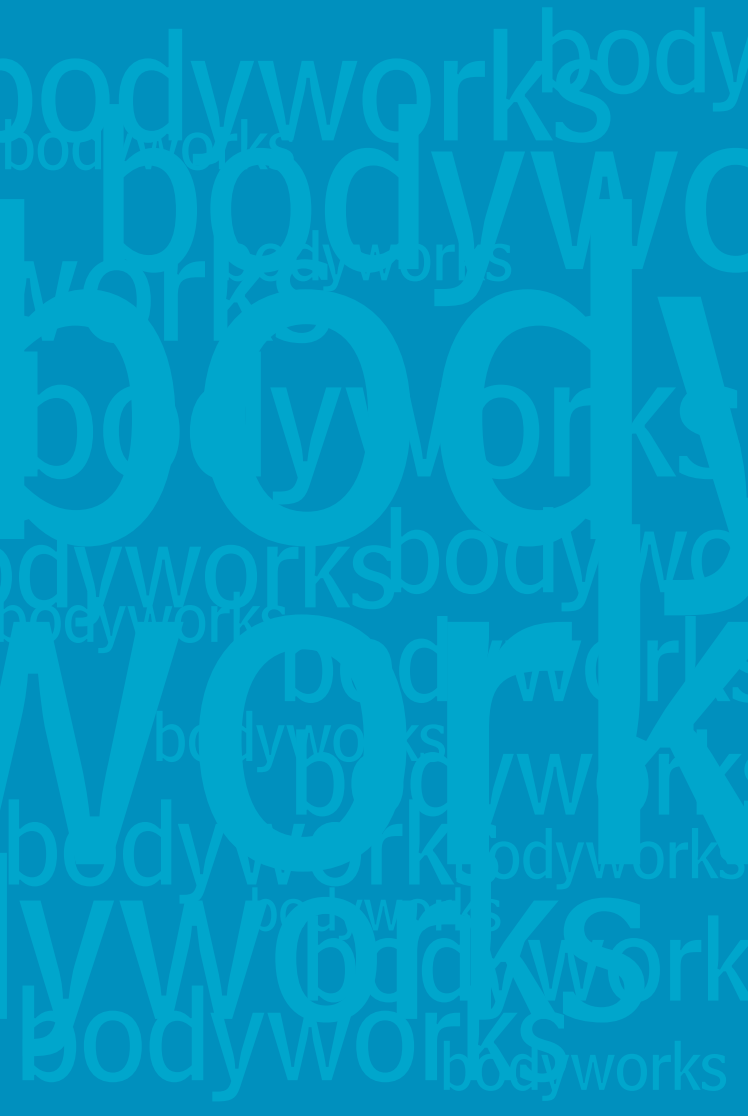


Bodyworks

Your guide to
understanding reproduction



Bodyworks

This booklet will tell you all about the reproductive system in men and women. It's particularly useful if you want to understand:

- how the reproductive organs work
- the menstrual cycle (ovulation and periods)
- what's involved in conception (getting pregnant)
- how contraception works to prevent pregnancy.

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Women's bodies

The reproductive system in women is made up of external and internal organs. These are found in the lower abdomen, the part of the body below the umbilicus (tummy button). This area is often referred to as the pelvic area. They include:

The external organs

- vaginal entrance
- urethral opening
- labia (vaginal lips)
- clitoris.

The external organs are known as the vulva.

The internal organs

- ovaries
- fallopian tubes
- uterus (womb)
- cervix
- vagina.

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The female reproductive organs outside the body

The **vulva** includes the opening to the **vagina**, the opening to the **urethra** (tube that you urinate – pee – through) the inner and outer lips (called **labia**) and the **clitoris**. The external part of the clitoris is found towards the front of the vulva - it is highly sensitive and when stimulated can make women feel sexually aroused and lead to orgasm.

Hormones and eggs – did you know!

- The female sex hormones, **estrogen** and **progesterone**, are responsible for female characteristics such as body shape, developing breasts, periods and controlling the **menstrual cycle**.
- An ovary contains about two million eggs at birth.
- During a woman's reproductive life only about 400–500 eggs will be released at ovulation.
- As a woman gets older the number and quality of her eggs decline making conception more difficult.

The female reproductive organs inside the body

Ovaries

Women have two **ovaries**, one on each side of the **uterus**. Ovaries are the size and shape of almonds and they contain **ova** (eggs) in structures called **follicles**. The ovaries also produce the two female sex hormones – estrogen and progesterone.

A hormone is a chemical messenger which is released in the blood to target specific organs. Sex hormones are responsible for sexual development and reproduction.

The fallopian tubes

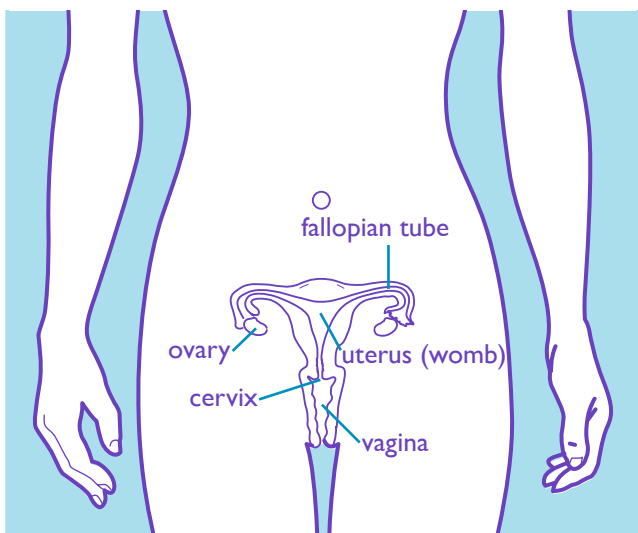
The two **fallopian tubes** are found on each side of the uterus, near the ovaries. These are tiny tubes – each is about 10–12.5cm long. The funnel-like end of the fallopian tube picks up the egg released by the ovary. Tiny, microscopic hairs line the inside of the fallopian tubes and help move the egg along to the uterus. The inside of the tube can easily be damaged or blocked by infection.

The uterus

The **uterus** is about the size and shape of an upside down pear. It is hollow, very stretchy and made of muscle. This is where the baby develops if a woman becomes pregnant. The uterus can stretch to hold a baby and shrink back to its pre-pregnancy size after the baby is born.

The cervix

The lower part of the uterus which connects to the vagina is called the **cervix**. Sperm, released by the man during sex, swim from the vagina through the cervix to reach an egg.



The cervix contains small glands which produce secretions called **mucus**. Mucus alters in texture and amount during a woman's menstrual cycle. Around the time of ovulation – when she is in her fertile phase – it changes from being thick, sticky and creamy in colour to being clearer, wetter and more stretchy – like raw egg white. These changes allow sperm to pass through the cervix and reach the egg more easily. When a woman is pregnant, the cervix becomes plugged with very thick mucus to protect the developing baby from infection.

Vagina

The **vagina** is a muscular tube which leads from the cervix to the vaginal opening (vulva). The vaginal opening is between the legs, between the **urethra** at the front and the anus at the back.

The vagina tilts upward and towards the small of the back. It has glands which produce lubricating secretions when women are sexually aroused to help the penis enter the vagina (**penetration**).

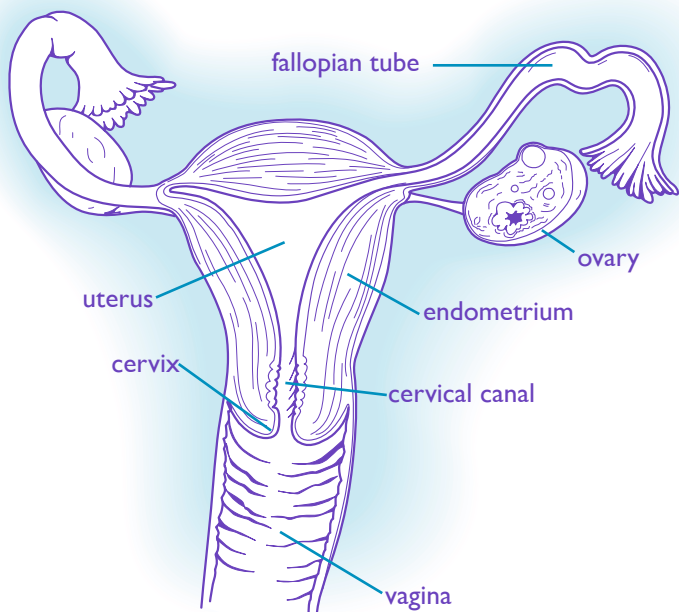
The vaginal walls are stretchy, allowing it to hold a tampon and stretch around a penis during sex, or a baby during delivery.

The menstrual cycle

The menstrual cycle is the process during which an egg develops and is released from the ovaries, and the **endometrium** (lining of the uterus) prepares for a possible pregnancy. If a woman does not become pregnant the lining of the uterus is shed as her period. It is controlled by hormones.

How long does the cycle take?

- The number of days in the menstrual cycle is calculated from the first day of the period to the day before the start of the next period.



- The average length of the menstrual cycle is around 28 days, although many women have longer or shorter cycles and this is normal.

What happens during the menstrual cycle?

- The first day of the period is known as day one of the cycle. When a woman has her period about 20 eggs start to develop in the ovary.
- The hormone estrogen causes the endometrium to start to thicken in preparation for a fertilised egg. It also causes the mucus in the cervix to become thinner, wetter and more stretchy, allowing sperm to reach an egg more easily.
- Regardless of how long or short a woman's cycle is, **ovulation** (egg release from an ovary) will

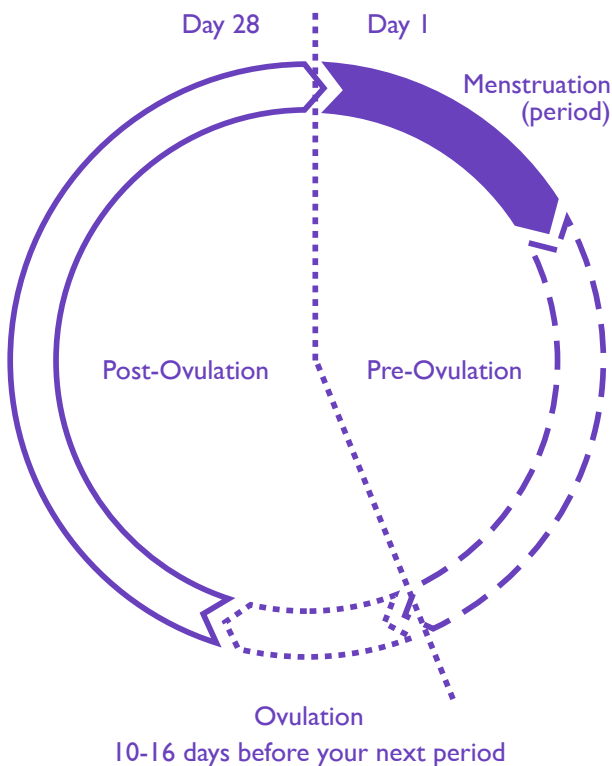
usually happen around 10–16 days before the start of her next period. However, the time from the first day of the period to ovulation can vary between women.

- Occasionally, more than one egg is released during ovulation (this happens within a few days of the first egg being released). If more than one egg is fertilised it can lead to a multiple pregnancy such as twins. If one egg divides into two during development it can also lead to twins.
- Ovulation triggers the production of a second hormone, progesterone. This prepares the endometrium even further, ensuring that it is spongy, thick and full of nutrients so that a fertilised egg can **implant** into it.
- After ovulation the cervical mucus goes back to being thick and sticky. If the egg is not fertilised it will be reabsorbed naturally by the body, the level of hormones falls, and this menstrual cycle comes to an end.
- The cycle then begins again. The endometrium breaks down and is shed through the vagina as a period, also called **menstruation**.

The menopause

When a woman is around 50 years old her ovaries stop producing eggs. Her periods stop and she is no longer fertile. This is called the menopause.

The time leading up to the menopause is called the perimenopause, and it is during this time that the hormonal and biological changes associated with the menopause begin. For example, a woman's periods could become more or less frequent, or shorter, before stopping altogether.



Periods – did you know?

- Some menstrual cycles can be as short as 21 days and some as long as 40 days.
- Some women have menstrual cycles that vary in length from month to month.
- The average amount of menstrual blood lost in a period is three to five tablespoons.
- A period usually lasts between two to eight days.
- Some women have pain around ovulation – known as **Mittelschmerz** – this means 'middle pain'.

Men's bodies

Men's reproductive organs are found entirely outside the body.

The male reproductive organs

Penis

The penis has two main parts, the head and the shaft. Urine and semen come out of it. The head is surrounded by a sleeve of skin called the foreskin. Some men have their foreskin removed by surgery – this is called circumcision.

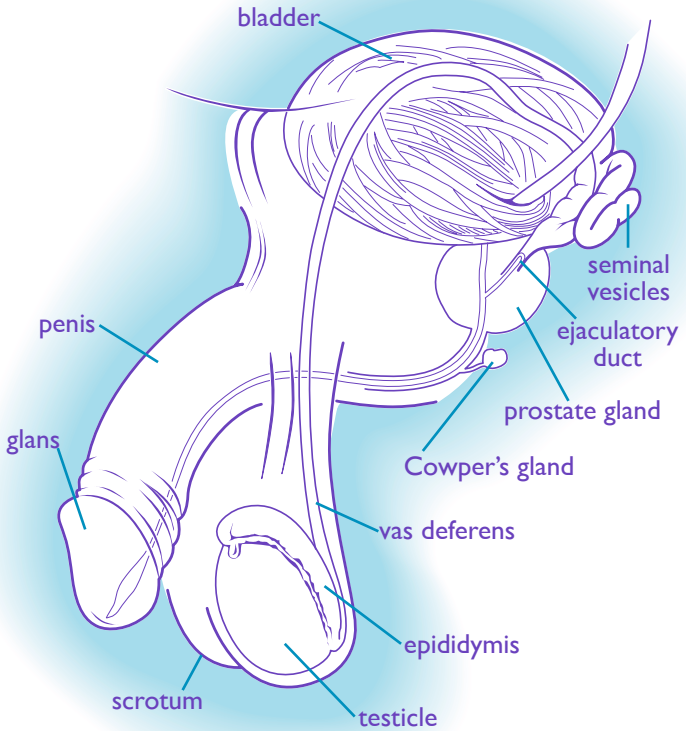
Usually the penis is soft and hangs down over the scrotum but it can become erect. When a man is sexually excited (and at other times too) the penis fills with blood and becomes stiff, grows longer and wider and sticks outwards and upwards from the body. This is known as an **erection**. The foreskin also stretches to leave the head of the penis completely exposed.

The shape of an erect penis varies although it usually curves upwards slightly, and may point to one side. Penis size also varies but not by very much. Adult penis size is usually between 8.5–10.5cm long when soft, and between 15–18cm when hard.

Testicles and scrotum

The **testicles** are the male equivalent of a woman's ovaries. Inside the testicles sperm are made and important male hormones produced. Men have two testicles, roughly the size of two small plums, and they are protected in a soft pouch of skin called the **scrotum**.

The scrotum hangs outside the body just behind the **penis** and between the legs. Its position helps to keep the testicles cool – the average body



temperature (37°C) is too hot to produce healthy sperm. They are very sensitive to heat – if they get too hot the scrotum drops down to cool off and when they are cold it shrinks closer to the body to keep warm.

Male hormones

The testicles produce the male hormone **testosterone** which is responsible for sperm production and growth. It is also important for male sex drive and controls male characteristics such as hair growth and the deepening of the voice.

Sperm – did you know?

- Boys start to produce sperm at puberty, the time when their body goes through changes from a boy to a man.
- It takes about 80 days for a sperm to be produced, but as production is a continuous process there is always plenty of fully mature sperm at any one time.
- On average men produce around 150–1,000 million sperm everyday, so they are unlikely to run out.
- Sperm are excellent swimmers. With the right type of conditions some sperm will enter the cervix within minutes of sex and move through the uterus in 2–7 hours.
- Sperm are also survivors and can live for up to five days on average inside the woman's body but up to seven days if the conditions are right.

Sperm

Inside each testicle are many tightly coiled tubes. Individual **sperm** are continuously made in these tubes. The sperm travel along the tiny tubes to a larger coiled tube called the **epididymis** which is at the top of the testicle. They stay here until they are fully mature and ready to be ejaculated.

Sperm are made up of three main parts:

- the head, containing the chromosomes (see page 17)
- the middle
- the tail, which help the sperm to move quickly to reach the egg.

Ejaculation

At **ejaculation** sperm passes along the **vas deferens** (sperm ducts) to the penis and out of the body

through the urethra. On the way, fluid from the **seminal vesicles** and **prostate gland** is added to the sperm. This helps nourish and transport them and gives **semen** (as it is now called) its white creamy appearance. The average ejaculation contains 2–4ml of semen (about a teaspoon) and each ml contains around 100 million sperm.

To prepare for ejaculation a small amount of lubricating fluid, known as **pre-ejaculation fluid** is produced from the **Cowper's glands**. This fluid leaks out of the penis before ejaculation and may contain sperm. When a man ejaculates, the muscles of the penis contract forcing the semen out of the penis in spurts. Straight after ejaculation the semen is thick but it becomes more liquid after a few minutes – this helps to release the sperm.

Conception (getting pregnant)

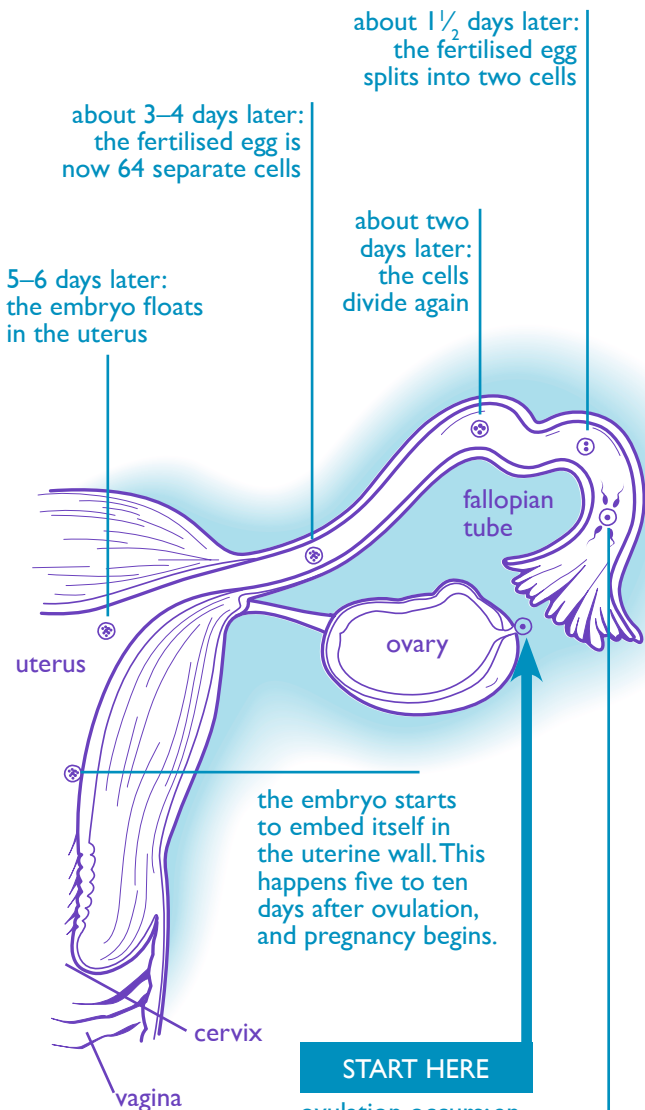
Conception is a process that begins with fertilisation and ends with implantation – getting pregnant. For fertilisation to take place an egg needs to meet a sperm – usually through a man and woman having sex.

- The ovary releases an egg as part of the menstrual cycle and it is picked up by the fallopian tube. There it can be fertilised by the sperm. Sperm are able to wait in the uterus and fallopian tube until ovulation.
- Small beating hairs and tiny wave-like contractions help the egg travel along the fallopian tube where it may meet a sperm within minutes or hours of ovulation. The egg only lives for up to 24 hours so the chance of pregnancy increases if the sperm are ready and waiting. If

you have sex 2–3 times a week you will help ensure there is always sperm waiting.

- The sperm attaches itself to the egg and produces a special substance that dissolves the outer coat of the egg. Only one sperm will be able to enter the egg and once it has entered, the egg coating is repaired to prevent other sperm from getting in.
- Once the sperm is fully inside the egg, fertilisation has taken place.
- The fertilised egg is wafted down the fallopian tube to the ready-prepared uterus. Here, the embryo settles and over a few days attaches itself to the thick, nutritious lining. Implantation has now taken place, conception is complete and the pregnancy begins. The time from ovulation to implantation is around 5–10 days.
- Once the pregnancy has begun, the pregnancy hormone **human chorionic gonadotrophin (hCG)** is produced.

Sometimes a pregnancy develops outside the uterus, usually in the fallopian tube. This is called an **ectopic pregnancy**.



START HERE

ovulation occurs; an egg is released from the ovary into the fallopian tube. It lives for up to 24 hours. If unprotected sex has taken place, sperm surround the egg. One breaks through to fertilise it.

Conception – did you know?

- Conception is a process that starts with fertilisation and ends with implantation.
- It takes about 15 minutes for the sperm to cross the outer membrane and enter the egg.
- The egg can be fertilised by sperm that have been ejaculated up to seven days before.
- The egg has special places on the outside coat that attract the sperm.
- It takes a couple an average of 3–6 months to conceive, if they are having sex frequently (2–3 times per week) during their fertile time.
- An average pregnancy lasts 280 days.

Pregnancy

The pregnancy test

The earliest and most reliable sign of pregnancy for women with a regular menstrual cycle is a missed period. Sometimes the period may be shorter or lighter than normal.

A woman can carry out a pregnancy test from the first day of a missed period. Tests carried out earlier than this are not always accurate. For women who don't have regular periods, the earliest time to do a test is 21 days from the last time that they had unprotected sex. For some women the test does not show positive until their period is at least a week late.

Pregnancy tests look for the hormone hCG which is found in the urine of pregnant women. A positive test is almost always correct. But a woman can sometimes get a negative result if the test is carried out too early or not correctly, even though she may be pregnant.

It's all in the genes

How a baby looks is determined by the genes it inherits from its parents. Genes are contained in **chromosomes** – tiny thread-like structures – and each chromosome contains thousands of genes. It is these genes that determine your height, build, blood group, and eye and hair colour. Some characteristics will be inherited from the mother and some from the father.

So how is the sex of the baby decided?

An egg has 22 chromosomes and one sex chromosome known as the X chromosome. A sperm also has 22 chromosomes and one sex chromosome which can either be an X or a Y chromosome. It is the sperm's chromosome that determines the sex of the baby. A simple way to look at it is like this:

- If the egg is fertilised by a sperm containing an X chromosome the baby will be female.

Mother X + Father X = XX = Female

- If the sperm contains a Y chromosome the baby will be male.

Mother X + Father Y = XY = Male.

To date, there is no reliable scientific evidence to support claims made for choosing the sex of the baby, such as when you have sex, sexual positions or diet.

Contraception and sexual health

Understanding how your body works can help you and your partner to plan a pregnancy or to avoid one. There are many different methods of contraception which suit people at different times of their lives. They all work in different ways, either by preventing or affecting ovulation, stopping fertilisation by preventing the sperm from meeting the egg, or by identifying the fertile and infertile times of the menstrual cycle.

FPA produces a range of easy-to-read booklets about contraception, common sexually transmitted infections, pregnancy choices, abortion and planning a pregnancy.

For more information visit www.fpa.org.uk.

How do I find out about contraception services?

The Sexual Health Information Line provides confidential advice and information on all aspects of sexual health. The number is **0800 567 123** and the service is available from Monday to Friday from 9am - 8pm and at weekends from 11am - 4pm.

For additional information on sexual health visit www.fpa.org.uk

Information for young people can be found at www.brook.org.uk

Clinics

To locate your closest clinic you can:

- Use Find a Clinic at www.fpa.org.uk/clinics
- Download FPA's Find a Clinic app for iPhone or Android.

You can find details of general practices and pharmacies in England at www.nhs.uk and in Wales at www.nhsdirect.wales.nhs.uk. In Scotland you can find details of general practices at www.nhs.24.com and in Northern Ireland at www.hscni.net

Emergency contraception

If you have had sex without contraception, or think your method might have failed, there are different types of emergency contraception you can use.

- The emergency contraceptive pill, Levonelle - can be taken up to three days (72 hours) after sex. It is more effective the earlier it is taken after sex. It is available with a prescription or to buy from a pharmacy.
- The emergency contraceptive pill, ellaOne - can be taken up to five days (120 hours) after sex. It is only available with a prescription.
- An IUD - can be fitted up to five days after sex, or up to five days after the earliest time you could have released an egg (ovulation).

Ask your doctor, nurse or pharmacist about getting emergency pills in advance, just in case you need them.

Sexually transmitted infections

Most methods of contraception do not protect you from sexually transmitted infections.

Male and female condoms, when used correctly and consistently can help protect against sexually transmitted infections. If you can, avoid using spermicidally lubricated condoms. The spermicide commonly contains a chemical called Nonoxinol 9, which does not protect against HIV and may even increase the risk of infection.

A final word

This booklet can only give you general information. The information is based on Heffner, L J and Schust D J, *The Reproductive System at a Glance* (3rd edn, Oxford: Wiley-Blackwell, 2010).

Remember - contact your doctor, practice nurse or a sexual health clinic if you are worried or unsure about anything.



talking sense about sex



www.fpa.org.uk

The Sexual Health Line is provided by the Department of Health. This booklet is produced by the sexual health charity FPA, registered charity number 250187. Limited liability company registered in England, number 887632. Supported by the Department of Health. FPA does not run the Sexual Health Line.

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The information in this booklet was accurate at the time of going to print. Booklets are reviewed regularly. Next edition available in 2015.

If you would like the information on the evidence used to produce this booklet or would like to provide us with feedback about this booklet email feedback@fpa.org.uk

