

A GUIDE TO

FERTILITY

TERMINOLOGY

WHEN ARE WOMEN & MEN MOST FERTILE?

There is only a specific time in each menstrual cycle when it's possible to get pregnant. This 'fertile window' is once a month, generally close to the time of ovulation when the woman ovulates and releases an egg approximately 2 weeks before the next period is due. Men do not have a 'fertile window' because sperm is continually formed and stored in the testicles, ready to be used at any time.

Graphic 1 shows when pregnancy is most likely to happen in people having sexual

intercourse without contraception. Day '0' is the day of ovulation when the egg is released. The pink section in Graphic 1 shows that pregnancy is most likely to happen when sex takes place in the 3 days before ovulation. For example, the chance of pregnancy if people have sex -2 days before ovulation is 26% compared to 1% if they have sex +1 day after ovulation.

Because most women do not know on which day of the month they ovulate, contraception is recommended to avoid pregnancy.

MORE INFORMATION
NHS Choices webpage: **Contraception**

This guide gives you information about fertility and infertility. To help understand this information we've included an explanation of the main medical terms used.

EJACULATION: Semen is the fluid produced by the male sexual organs to protect and carry sperm. The process of discharging this fluid from the penis is called ejaculation.

INSEMINATION: Treatment that involves directly inserting sperm into a woman's womb

MENSTRUAL CYCLE: The monthly changes that occur in the female reproductive system (specifically the uterus and ovaries) which make pregnancy possible. The length of the menstrual cycle is calculated as the time from the first day of a woman's period (bleeding) to the day before her next period or bleeding. The average time between two periods for women is about 28 days but in teenagers it could be longer (up to 45 days) and sometimes 2 to 3 months, becoming shorter as the teenager gets older. There are events that occur during the menstrual cycle which are repeated each month. These are: development of the egg (phase 1), release of the egg from one of the ovaries (phase 2), preparation of the uterus for a pregnancy (phase 3), and menstruation or bleeding (phase 4). The next period then happens if there is no pregnancy. Young women should have regular periods within 3 years of the first period occurring. Women could have some spotting in early pregnancy.

MENOPAUSE: The menopause is the time when menstrual periods stop permanently, and women are no longer able to have children. For most women this happens at about 51 years. The age a woman will reach menopause generally be similar to the age at which her mother reached menopause.

OVULATION: is the release of the oocyte (mature egg, sometimes called ovum) from the ovaries, ready for fertilization. Ovulation occurs about two weeks before the next period is due, for example around day 14 of a 28-day cycle or day 21 of a 35-day cycle. The actual day of release could differ between cycles and between women, and is affected by many factors (e.g. lifestyle).

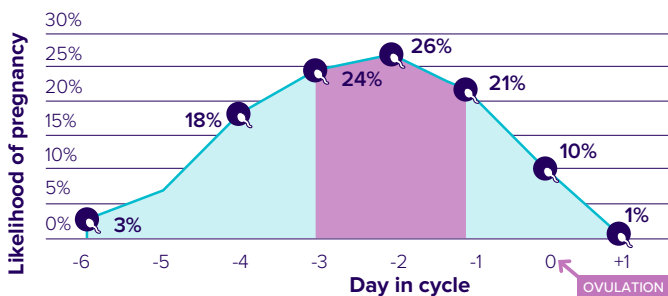
OVARIES: The two oval-shaped organs located in the lower abdomen (right and left side) that produce the female eggs.

EGGS AND SPERM: Cells that are produced by the ovary (eggs, oocytes, ova) and testicles (sperm) and that combine after sex to produce a pregnancy. Women produce eggs and men produce sperm. A healthy sperm is motile, which means it has the ability to move. This movement is what makes it possible for sperm to reach the egg.

TESTICLES ALSO CALLED TESTES OR BALLS: Oval-shaped organs that sit in a sac that hangs behind the penis. A main job of testicles is to make and store sperm.

MORE INFORMATION
NHS Choices webpage: **Ovulation**

GRAPHIC 1: THE DAYS IN THE CYCLE WITH THE HIGHEST CHANCE OF GETTING PREGNANT



There are ways to help predict ovulation but these methods are not a reliable form of contraception.

HOW MANY MONTHS CAN IT TAKE TO GET PREGNANT?

If a couple were trying to get pregnant it would be difficult to estimate how long it would take for the woman to get pregnant. Sometimes pregnancy happens quickly but it often takes a few months of trying.

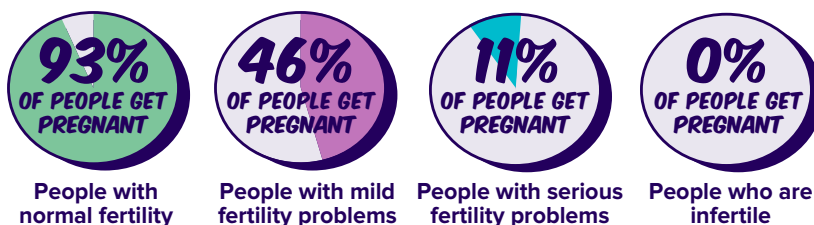
Graphic 2 shows the percentage of men and women having regular unprotected sexual intercourse without contraception who would get pregnant in 1 year, according to their fertility level. By 'regular' we mean having sexual intercourse two to three times per month (National Institute of Clinical Excellence, 2013). If the couple were fertile, 93% would get pregnant, but if they had a mild fertility problem only 46% would get pregnant. If the couple had serious

fertility problems then very few would get pregnant, less than 11%. Examples of fertility problems would be sluggish but forward moving sperm, irregular menstrual periods or one or two blocked fallopian tube(s).

Graphic 2 also shows that even people with mild fertility problems can get pregnant. The National Institute for Health and Care Excellence (NICE) says that if you've been trying to get pregnant for more than 1 year without success then you should talk to your doctor. If you're over 35 or older or think that you or your partner might have a fertility problem then speak to your doctor after 6 months of trying without success.

MORE INFORMATION
NHS Choices webpage: **How long does it usually take to get pregnant?**

GRAPHIC 2: PERCENTAGE OF PEOPLE WHO WOULD GET PREGNANT AFTER 1 YEAR OF TRYING



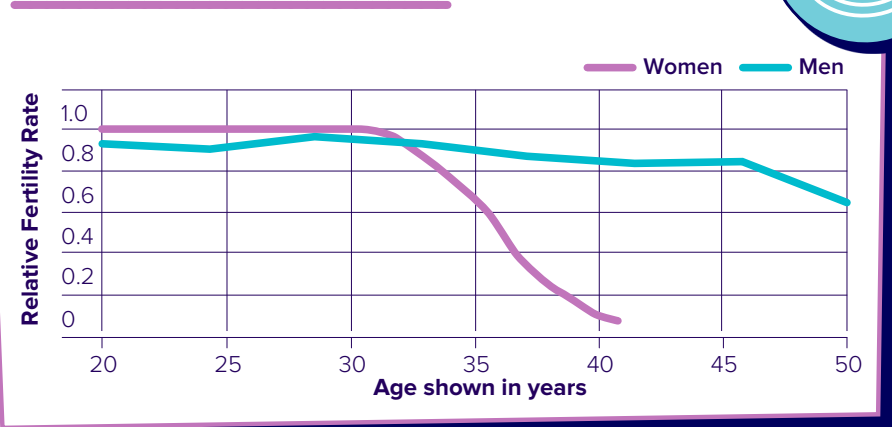


AT WHAT AGE DOES FERTILITY BEGIN TO DECREASE?

Girls are born with a fixed number of immature eggs in their ovaries. The number of eggs decreases as women get older. At birth, most girls have about 2 million eggs, at adolescence that number has gone down to about 400,000, at age 37 there remain about 25,000. By age 51 when women have their menopause they have about 1000 immature eggs but these are **not** fertile. At every menstrual cycle one of the immature eggs will mature and be released during ovulation. The eggs that are not released die and get re-absorbed into the body. The quality of the eggs also gets poorer as women get older. All other things being equal the number and quality of the woman's eggs determines her fertility.

Graphic 3 shows that on average there is a marked decline in female fertility in the mid-thirties, with lower fertility especially after the age of 35. Women's fertility will continue to decrease every year, whether or not she is healthy and

GRAPHIC 3: MONTHLY FERTILITY RATE BY AGE³



fit because the number and quality of the eggs decreases with age. Even if a woman is not ovulating (for example if she is taking the contraceptive pill, or is pregnant), the number of eggs continues to decline at the same rate. How quick a woman's fertility declines will depend on a combination of genetic and lifestyle (e.g. smoking) factors.

Men are not born with their sperm. Men produce sperm daily. Men's fertility also starts to decline around age 40 to 45. The decrease in fertility is caused by the decrease in the number and quality of

the sperm they produce. Men can have fertility problems even if they can still have sex and have an ejaculation.

If you are concerned about your age and your fertility, you may consider having your fertility tested. Fertility tests for men and women are available at pharmacies, online and at fertility clinics. You can discuss your fertility with your doctor.

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MORE INFORMATION
NHS Choices webpage: **Protect your fertility**

WHEN SHOULD YOU START TRYING TO GET PREGNANT?

Because the fertility of women declines, many women who want children want to know at what age they should try to get pregnant to have a good chance of having the family they want. Researchers have created a chart that may help women (and their partners) make that decision.

To use the chart you need to know:

1. The size of family you would like (e.g. 1, 2, or 3 children)
2. Whether you would be willing to use fertility treatments (e.g. IVF) if you or your partner could not become pregnant naturally
3. Your desired certainty that you will achieve the family size you want (e.g. 50%, 75%, or 90% sure).

Graphic 4 shows when a woman would need to start trying to get pregnant to have the number of children she wanted.

For example, the green numbers show that if a woman wanted to be 90% certain that she would have at least 3 children without ever using fertility treatment, then she would need to start trying for a family at 23. But, she could start aged 36, if she was willing to use fertility treatment and have a lower certainty (50%)

GRAPHIC 4: MAXIMUM FEMALE AGE AT WHICH WOMEN SHOULD START TRYING TO GET PREGNANT FOR 1, 2, OR 3 CHILDREN AND FOR A 50%, 75% AND 90% CHANCE OF REACHING THE DESIRED FAMILY SIZE WITH AND WITHOUT USING FERTILITY TREATMENT⁴

CHANCE OF MEETING FAMILY SIZE GOAL		1 CHILD	2 CHILDREN	3 CHILDREN
WITHOUT IVF	50%	41 yr	38 yr	35 yr
	75%	37 yr	34 yr	31 yr
	90%	32 yr	27 yr	23 yr
WITH IVF	50%	42 yr	39 yr	36 yr
	75%	39 yr	35 yr	33 yr
	90%	35 yr	31 yr	28 yr

of having 3 children (see blue numbers).

Women (and their partners) can use this chart to decide when to start trying to get pregnant. If you know you have fertility problems that can be overcome with fertility treatment then look at the ages with fertility treatment (with IVF). Such a chart does not yet exist for men.

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MORE INFORMATION
NHS Choices webpage: **Planning your pregnancy**

WHAT IS INFERTILITY?

Infertility (often called subfertility) is a disease of the reproductive system defined by the failure to achieve a pregnancy after 12 months or more of regular unprotected sex (without contraception) between a man and a woman. Around 9 to 15% of couples will have fertility problems. Infertility can affect men and women.

Infertility in women can be due to diverse problems. It could be a problem within the ovaries. For example eggs may be of low fertility, or ovulation may not occur, or it

may occur but irregularly which would affect how often she has her period. Infertility could also be due to problems with the fallopian tubes caused by a blockage (often after infection) or with the uterus (or womb). Women can have fertility problems even if they still have regular periods.

Infertility in men is most often due to too few sperm, poor sperm quality or sperm that do not move properly. Men's infertility could also be due to mumps when it occurs during puberty. Mumps is a

MORE INFORMATION
NHS Choices webpage:
Fertility problems

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WHAT ARE THE SIGNS AND SYMPTOMS OF INFERTILITY?

The most obvious sign of infertility is when the woman does not get pregnant, despite having regular unprotected sex for 12 months or more (or after six cycles of insemination for same-sex couples).

Once a woman has a regular (monthly) menstrual cycle, any change in her menstrual cycle could indicate a problem. If her menstrual cycle becomes less regular, infrequent or absent then there could be a problem with ovulation. Heavier or more painful periods could be a sign of fibroids in the womb or a condition called endometriosis. Pelvic pain could be a sign of infection or endometriosis.

There are few signs for male infertility. A man usually has to have medical

tests to find out if he has a fertility problem. A man's ability to have sex and ejaculate can be normal even if he has fertility problems. Men who have had mumps during puberty and men who have an undescended testis (testicle) could be at risk of fertility problems. An undescended testis means that the testis is not located in the scrotum.

If you have noticed any of the signs or symptoms mentioned in **Graphic 5** or are concerned about your fertility, then talk to your doctor. The NHS 'Fertility Self Assessment tool' could also help you to decide if and when to seek help from your doctor. Fertility declines with age. Women aged 35 or older should seek help after 6 months of trying to get pregnant because if they need treatment then it is best not to delay.

GRAPHIC 5: SOME SIGNS THAT COULD SUGGEST A FERTILITY PROBLEM⁵

The following can suggest that a woman has a fertility problem:

- > ABNORMAL PERIODS (BLEEDING DIFFERENT THAN NORMAL)
- > IRREGULAR PERIODS (DAYS IN CYCLE DIFFERENT EVERY MONTH)
- > PERIOD CYCLE LESS THAN 21 DAYS
- > PERIOD CYCLE MORE THAN 35 DAYS
- > NO PERIODS
- > SEVERE PERIOD PAIN

GRAPHIC 6. FERTILITY SELF AWARENESS TOOLS

There are many ways to find out your level of risk for fertility problems

MORE INFORMATION
NHS 'Fertility Self Assessment tool'

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WHAT ARE THE MAIN PREVENTABLE CAUSES OF INFERTILITY?

There are activities that can reduce fertility. The top four activities that can affect your fertility are:

1. Being overweight with a body mass index over 25 (You can find out your body mass index on the NHS Choices website: Healthy weight calculator.
2. Smoking especially when more than 10 cigarettes a day.
3. Having sexually transmitted infections.

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4. Drinking too much alcohol - more than 6 units/week for women or 12 units/week for men. A unit is a small glass of wine, half a pint of beer or shot of spirits. Changing to a healthier lifestyle (e.g., stopping smoking and heavy drinking, or losing weight) can improve your chances of getting pregnant and of having a healthier pregnancy and baby.

There are many websites and apps to help you live a healthier life.

MORE INFORMATION
NHS Choices webpage:
Live well

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WHAT REPRODUCTIVE TECHNOLOGIES ARE AVAILABLE TO INFLUENCE FERTILITY?

A reproductive technology is a technique used to influence human reproduction. There are many technologies each with a different purpose.

Some of the most common techniques along with a brief description, common reasons for use, and success rates are shown in **Graphic 7**.

MORE INFORMATION

HFEA webpage:
Fertility Options



GRAPHIC 7: REPRODUCTIVE TECHNOLOGY OPTIONS

TECHNIQUE	DEFINITION	PURPOSE	SUCCESS RATE
CONTRACEPTION	<ul style="list-style-type: none"> Barrier (condom) and non-barrier (hormones, coil) methods of preventing pregnancy 	<ul style="list-style-type: none"> Prevent pregnancy 	<ul style="list-style-type: none"> Highly effective, when used correctly
MEDICALLY ASSISTED REPRODUCTION (MAR)	<ul style="list-style-type: none"> Reproduction brought about through some form of medical intervention 	<ul style="list-style-type: none"> To bypass problems with fertility for example, irregular ovulation, blocked, fallopian tube, adhesions, endometriosis, poor sperm quality * Examples include medication to stimulate production of eggs, insemination and in vitro fertilisation 	<ul style="list-style-type: none"> MAR can increase chance of pregnancy but can't fully compensate for age-related infertility
USE OF DONOR EGGS, SPERM, EMBRYO	<ul style="list-style-type: none"> Using the eggs, sperm or embryo donated by another person or couple to have a child 	<ul style="list-style-type: none"> Help people with fertility problems unable to produce egg, sperm or embryos, or achieve fertilisation Help same-sex couples or others unable to have heterosexual sex Single women or men People with certain disabilities Lesbian, Gay, Bisexual, Transgender people 	<ul style="list-style-type: none"> Varies and depends on individual circumstance (e.g., age, type of problem)
EGG AND SPERM FREEZING	<ul style="list-style-type: none"> Producing sperm or taking fertility drugs at a younger age to produce eggs that will be frozen now for use later at an older age. 	<ul style="list-style-type: none"> Postpone having children Increase chances of pregnancy at an older age 	<ul style="list-style-type: none"> Varies based on age of women when freezing eggs. If freezing under age 35 better chance of future pregnancy
SURROGACY	<ul style="list-style-type: none"> When a woman (the surrogate) carries and gives birth to a baby for another person or couple (the intended parents) 	<ul style="list-style-type: none"> For women with malformations in the womb (or after hysterectomy) or when pregnancy may be dangerous For gay single men or couples wanting to become parents 	<ul style="list-style-type: none"> Good chance of success but could depend on type of surrogacy

REFERENCES

Graphic 1: Adapted from Colombo & Masarotto (2000). *Daily fecundability: First results from a new database*. *Demographic Research*. Retrieved from <http://www.demographic-research.org/volumes/vol3/5/3-5.pdf>

Graphic 2: Adapted from Evers, J. L. H. (2002). *Female sub fertility*. *Lancet*, 360, 151-159.

Graphic 3: Reprinted **with permission from** *Trends in Endocrinology and Metabolism*, 18, Broekmans, F. J., et al. *Female reproductive ageing: current knowledge and future trends*, p. 59, 2007, with permission from Elsevier. *Male data not in original*.

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Graphic 4: Habbema, J. D. F., Eijkemans, M. J. C., Leridon, H., & te Velde, E. R. (2015). *Realizing a desired family size: when should couples start?* *Human Reproduction*, 30, 2215-2221. By permission of Oxford University Press.

Graphic 5 & 6: Bunting, L. & Boivin, J. (2010). *Development and preliminary validation of the Fertility Status Awareness Tool: FertiSTAT*. *Human Reproduction*, 25, 7, 1722-1733.



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