

# Assessment and treatment for people with fertility problems

Information for the public

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## About this information

NICE guidelines provide advice on the care and support that should be offered to people who use health and care services.

This information explains the advice about assessment and treatment for people with fertility problems that is set out in NICE guideline CG156.

This is an update of advice on fertility that NICE produced in 2004.

## *Does this information apply to me?*

Yes, if:

- you have fertility problems (that is, you or your partner are having trouble getting pregnant)
- you need particular treatment or help for you or your partner to get pregnant, including if:
  - you are in a same-sex relationship and have not been able to conceive through donor insemination
  - you are unable (or find it very difficult) to have sexual intercourse, for example, because of a physical disability

- you or your partner have a condition that means you need specific help to conceive (for example, a long-term viral infection such as HIV, hepatitis B or hepatitis C that could be passed on through unprotected sexual intercourse)
- you are preparing for cancer treatment that might affect your fertility and you wish to preserve your fertility.

## Fertility problems

Around 1 in 7 heterosexual couples in the UK seek advice at some time in their lives about difficulties in getting pregnant. The time it takes to conceive naturally varies and age can be an important factor: both women's and (to a lesser extent) men's fertility gradually declines as they get older.

A woman may have fertility problems because her ovaries do not produce eggs regularly, or because her fallopian tubes are damaged or blocked and the sperm cannot reach her eggs. In men, a fertility problem is usually because of low numbers or poor quality of sperm. For up to a quarter of people, no reason can be found for their fertility problems. This is known as unexplained infertility.

## Your care team

A range of professionals who specialise in different areas of treatment or support may be involved in your care. These could include GPs, practice nurses, fertility specialists and counsellors.

## Working with you

Your care team should talk with you about fertility problems. They should explain any tests, treatment and support you should be offered so that you can decide together what is best for you. There is a list of questions you can use to help you talk with your care team.

Some treatments or care described here may not be suitable for you. If you think that your treatment does not match this advice, talk to your care team.

## How long does it take to get pregnant?

In the general population, more than 8 out of 10 couples where the woman is aged under 40 will get pregnant within 1 year if they have regular sexual intercourse (that is, every 2 to 3 days) and do not use contraception. More than 9 out of 10 couples will get pregnant within 2 years.

For women under 40 who are using [artificial insemination](#) rather than sexual intercourse to conceive, more than half of women will get pregnant within 6 [cycles](#) of [intrauterine insemination](#). Within 12 cycles, more than 3 out of 4 women will become pregnant.

## Trying for a baby

There may be some things you can do to improve your chances of getting pregnant. Your GP should tell you more about the following.

### *How often to have sexual intercourse*

To give yourselves the best chance of success, try to have sexual intercourse every 2 to 3 days. If you are under psychological stress, it can affect your relationship and is likely to reduce your sex drive. If this means you do not have sex as often as usual, this may also affect you or your partner's chances of getting pregnant.

### *Smoking*

Smoking is likely to reduce fertility in women. Breathing in someone else's cigarette smoke (passive smoking) is also likely to reduce a woman's chances of getting pregnant. If you smoke, your GP should offer you help to stop if you wish. The NHS Smoking Helpline can also provide advice and support – the phone number is 0300 123 1044 and the website is [www.smokefree.nhs.uk](http://www.smokefree.nhs.uk).

For men, there is a link between smoking and poorer [semen](#) quality (though the effect of this on fertility is uncertain). Stopping smoking will improve your general health.

### *Alcohol*

For men, your fertility is unlikely to be affected if your alcohol consumption is within the recommended limit of 3 to 4 units of alcohol per day. A pint of normal-strength beer is about 2 units and a small (125 ml) glass of wine is about 1.5 units (for more information visit [www.nhs.uk/alcohol](http://www.nhs.uk/alcohol)). Drinking excessive amounts of alcohol can affect semen quality.

In women, alcohol can harm developing babies. If you are trying to get pregnant you can cut down the risk of harming your unborn baby by drinking no more than 1 or 2 units of alcohol once or twice a week.

## *Body weight*

The range of healthy weight is defined by the body mass index (BMI). A healthy weight is a BMI of between 20 and 25.

It can take longer to get pregnant if you are underweight (your BMI is under 19) or you are obese (your BMI is 30 or above). If you are underweight or overweight and you have irregular or no periods, reaching a healthy weight will help your ovaries to start working again.

If you are overweight, taking part in a group exercise and diet programme gives you a better chance of getting pregnant than trying to lose weight on your own.

Men who have a BMI of 30 or above are likely to have reduced fertility.

## *Your work*

At work, some people are exposed to X-rays, pesticides or other things that may affect their fertility. Your GP should ask you about the work that you do, and should advise you about any possible risks to your fertility.

## *Medicines and drugs*

Some prescription and over-the-counter medicines can interfere with your fertility. Your GP should ask you about any medicines you are taking and offer you appropriate advice. They should also ask you about recreational drugs (such as cannabis, cocaine and anabolic steroids) as these can also interfere with your fertility and damage a developing baby.

## *Other factors*

Other actions that people try to improve their fertility include reducing their caffeine intake (from drinks such as tea, coffee and cola) and using complementary therapies. However, it is not clear if there is an association between caffeine intake and fertility, and complementary therapies are not recommended because there has not been enough research looking at whether they improve fertility.

Men also sometimes try wearing loose-fitting underwear to help fertility. Higher temperatures in the scrotum can reduce semen quality, but it is not clear whether wearing loose-fitting underwear improves fertility.

## *Preparing for pregnancy*

### **Folic acid**

Women who are trying to get pregnant should take folic acid tablets (0.4 mg a day). Taking folic acid when you are trying for a baby and for the first 12 weeks of pregnancy reduces the risk of having a baby with neural tube defects (where parts of the brain or spinal cord do not form properly), such as spina bifida. If you have previously had a child with a neural tube defect, are taking medication for epilepsy, or have diabetes, you should take a larger dose of 5 mg a day.

### **Rubella (German measles)**

Women should be offered a test to find out whether you are immune to rubella. If you are not immune you should have a rubella vaccination before you try to become pregnant, because infection with rubella can harm unborn babies. You should avoid pregnancy for 1 month after your rubella vaccination.

### **Cervical smear tests**

Your GP should ask you when you last had a cervical smear test and what the result was. If a cervical smear test is due, you should have this test before you try to get pregnant.

## **If you are concerned about your fertility**

If you are concerned that you may have a fertility problem, your GP should ask you about your lifestyle, general health and medical history. They should ask how long you and your partner have been trying to get pregnant and about aspects of your sexual health and history that could be affecting your chances of having a baby.

If you and your partner have been trying to get pregnant for more than 1 year, you should both be offered tests (see [tests for men](#) and [tests for women](#)).

If you are using [artificial insemination](#) rather than sexual intercourse to conceive (using either donor [sperm](#) or your partner's sperm) and you are not pregnant after 6 [cycles](#), you should be offered tests. If you are having artificial insemination using your partner's sperm, your partner should also be offered tests.

You should be offered earlier referral for specialist advice and tests if any of the following apply:

- The woman is aged 36 years or over.
- There is a known medical reason for your fertility problems, for example you have had cancer treatment that has affected your fertility, or you have a condition or problem that may have affected your fertility.

If you or your partner has a long-term viral infection (such as HIV, hepatitis B or hepatitis C) that could be passed to your partner through unprotected sexual intercourse or passed to your baby, you should be referred to a centre that has the expertise to provide your investigations and treatment safely (also see [HIV, hepatitis B and hepatitis C](#)).

For couples who want to have a baby but are unable or find it very difficult to have sexual intercourse (for example, because of a physical disability), your GP should talk to you about your options for conceiving, and advise you on any further assessments you might need and possible treatments that could help you.

## What you can expect from your care

During your care and treatment, your healthcare team should give you information (including written information) about fertility problems and treatments to help you make informed decisions. Any investigation of your fertility problems should take place in an environment that enables you to discuss sensitive issues, such as sexual abuse, if you wish.

If you and your partner are having difficulty conceiving, any decisions you make about investigations and treatment will affect both of you. You should therefore be seen together whenever possible.

If you are diagnosed with a fertility problem, you should be treated by a specialist team. You should also be given information about appropriate support groups which you may find it helpful to contact.

## Counselling

You should have the opportunity to see a counsellor before, during and after any tests and treatment you have, regardless of whether the treatment is successful. The counsellor should be someone who is not directly involved in managing your treatment. They should talk over and help you think about what your fertility problems and treatment will mean for you. Fertility problems, investigations and treatment can be stressful, so it can help to discuss with someone your feelings about the future, whether or not your treatment enables you to have a baby.

## Tests for men

You should be offered a semen test to measure the quantity and quality of your sperm. Occasionally there is an abnormal result on the first semen test. If this happens a repeat test should be offered, ideally 3 months later. However, if it looks as though your sperm count is very low or you have no sperm at all, the test should be repeated as soon as possible.

## Tests for women

A woman's fertility declines with age. This means that the chances of getting pregnant, both naturally and through fertility treatment, fall as you get older. Your GP should give you more information about this.

Your GP should ask you how often and how regular your periods are. If you have regular monthly periods (every 26 to 36 days), you are likely to be ovulating. You should not be advised to use charts of your body temperature (known as basal body temperature) to check whether you are ovulating normally, as they are not a reliable test for this.

### *Checking your hormone levels*

You should be offered blood tests to check your hormone levels to see if you are ovulating. These may include a test to measure a hormone called progesterone, which is produced by the ovaries after the egg is released. The timing of the test will vary depending on how regular your periods are.

If your periods are irregular you should also be offered a test to measure hormones called gonadotrophins, which stimulate the ovaries to produce eggs.

### *Checking your ovaries*

You may also be offered tests to see how well your ovaries might respond to fertility drugs. This involves either a blood test to measure levels of hormones (called follicle-stimulating hormone and anti-Müllerian hormone) or an ultrasound scan to count the number of follicles in your ovaries.

### *Checking your fallopian tubes*

When the results of your tests and your partner's semen test are known, you may also be offered an examination to see whether your fallopian tubes are blocked. Depending on your circumstances and medical history, this might be done using X-rays, ultrasound, or by an operation called a

laparoscopy. Before you have this procedure, you should be tested for an infection called chlamydia. Chlamydia can damage your fallopian tubes if it is not diagnosed and treated with antibiotics. If you are infected, you and your partner (or partners) should be referred for treatment. If you do not have tests for chlamydia, you may be offered antibiotics before the procedure as a precaution in case you do have the infection.

### *Tests you should not be offered*

You should not normally be offered the following tests because they have not been shown to be helpful:

- tests of your cervical mucus after sexual intercourse (known as a post-coital test)
- a blood test to measure levels of a hormone called prolactin
- a biopsy (a procedure to take a small sample of tissue) of the lining of your womb
- an examination of your womb, called a hysteroscopy (in some circumstances your doctor may need to perform a hysteroscopy but it will be carried out as part of your laparoscopy).

## Treatments for men

### *Low sperm count or poor-quality sperm*

If tests find that your sperm count is low or the sperm are poor quality, you and your partner should continue trying to conceive through regular, unprotected sexual intercourse because it is still possible for you to conceive naturally. After you have been trying for a total of 2 years (this can include 1 year of trying before you had your fertility tests) you may be offered in vitro fertilisation (IVF).

### *Other conditions*

If you have a blockage in the flow of sperm from your testicles you may be offered surgery to remove the blockage. Alternatively you may be offered a procedure called surgical sperm recovery. The sperm that is collected is then used in IVF.

If you are unable to ejaculate, there are treatments that may help you and so improve your fertility. Alternatively, you may be offered surgical sperm recovery and IVF.



If you have low levels of gonadotrophins (hormones that stimulate the production of sperm) you should be offered treatment with gonadotrophin drugs to help improve your fertility.

### *Treatments you should not be offered*

There is not enough evidence that any of the following treatments can improve fertility:

- surgery for varicose veins in the scrotum (known as varicoceles)
- antibiotic treatment for white blood cells in your semen
- steroids for antisperm antibodies
- treatment with gonadotrophins or other fertility drugs for problems with sperm that have no known cause.

### **Treatments for women**

If your ovaries are not producing eggs normally you should be offered treatment to stimulate them to produce eggs. This is known as 'ovulation induction'. The type of treatment you need will depend on what is causing the problem.

### *Polycystic ovary syndrome*

Polycystic ovary syndrome (PCOS) is a common condition where your ovaries contain more eggs than normal but you do not ovulate regularly.

#### **Polycystic ovary syndrome and weight loss**

If you have polycystic ovary syndrome and you are obese (your BMI is 30 or above), losing weight may restart ovulation and increase your chance of becoming pregnant without needing any further treatment. If you do need to take fertility drugs, losing weight will improve how your ovaries respond to these drugs.

If you have polycystic ovary syndrome you should be offered drugs called clomifene citrate or metformin to help you start ovulating. You may be offered one of these drugs or both together. If you are taking clomifene citrate, you should take it for a maximum of 6 months to see whether it will help you.

If you are offered treatment with metformin, your doctor should explain that it can cause side effects, such as nausea, vomiting or other digestive symptoms.

Clomifene citrate and metformin do not work for everyone. If they do not help, you may be offered treatment with [gonadotrophins](#). However, your doctor should explain the increased risks of multiple pregnancy and ovarian hyperstimulation syndrome before you decide to start this treatment (see [risks of fertility drugs](#)).

An alternative treatment for polycystic ovary syndrome is called laparoscopic ovarian drilling, which is a surgical procedure that involves a general anaesthetic and a [laparoscopy](#). This can work just as well as treatment with gonadotrophins but does not need monitoring by ultrasound and does not increase your risk of multiple pregnancy.

Your doctor should tell you more about the risks, benefits and side effects of all of these treatments for polycystic ovary syndrome and methods of ovulation induction before you decide to try them.

## *Risks of fertility drugs*

### **Multiplepregnancy**

Ovulation induction using gonadotrophins or clomifene citrate increases your chance of becoming pregnant with more than one baby (a multiple pregnancy). Multiple pregnancies carry greater health risks for you and your babies. The babies are more likely to be premature and have low birth weight. To reduce the risk of multiple pregnancy, your response to these drugs should be monitored by ultrasound during treatment.

### **Ovarianhyperstimulationsyndrome**

There is a risk that your ovaries could 'over-react' to fertility drugs, known as ovarian hyperstimulation syndrome. Mild symptoms of this, including bloating and nausea, are relatively common, but severe ovarian hyperstimulation syndrome can be a serious condition. You should be monitored by ultrasound for this condition during your ovulation induction.

### **Long-termsafetyofovulationinduction**

There are not known to be any health risks (including cancer risks) directly associated with the use of fertility drugs for ovulation induction in women or in children born as a result of treatment. However, more research is needed into long-term safety. Your doctor should give

you up-to-date safety information before you start treatment. They should also limit the drugs used in ovulation induction to the lowest effective dose and length of use.

## *Other ovulation disorders*

If you have an ovulation disorder with low levels of gonadotrophin hormones and you have low levels of oestrogen (the female sex hormone), this is often due to low body weight or excessive amounts of exercise. Increasing your body weight (if your [BMI](#) is less than 19) and cutting down your exercise may be enough to restart ovulation. To help you ovulate, you may be offered gonadotrophins, or a treatment called pulsatile gonadotrophin-releasing hormone, in which a drug is given gradually through a pump to mimic the natural delivery of gonadotrophins within the body.

If you have a disorder called hyperprolactinaemia you should be offered treatment with a type of drug known as a dopamine agonist, such as bromocriptine. Your doctor should discuss with you the safety of dopamine agonists for women who are intending to get pregnant.

## *If your fallopian tubes are blocked*

If you have blocked [fallopian tubes](#) you may be offered surgery to correct it if the blockage is not severe.

If your fallopian tubes are blocked and swollen (a condition known as hydrosalpinx), you should be offered the choice of having your tubes removed through laparoscopy before IVF. This increases your chances of a successful pregnancy through IVF, but it means you will never be able to conceive naturally in the future.

## *Endometriosis*

Since this document was originally published, NICE has published a guideline on [endometriosis](#) – please refer to this for help and advice on this topic.

## *Adhesions in the womb*

A rare cause of fertility problems is adhesions (tissues that have joined together) in the womb causing a woman's periods to stop. If this happens you may be offered a minor procedure to clear

the adhesions, which may help your periods to start again and so improve your chances of getting pregnant.

## Unexplained infertility

If you have unexplained infertility it means that no reason has been found for your fertility problems. You may feel anxious to try fertility drugs but you should not be offered clomifene citrate (or other fertility drugs taken by mouth) because it has not been found to improve the chance of pregnancy compared with trying for a baby naturally.

If you have been trying to conceive through regular unprotected sexual intercourse for a total of 2 years (this can include 1 year of trying before you had your fertility tests) and have not become pregnant, you may be offered [IVF](#).

## HIV, hepatitis B and hepatitis C

If you or your partner is known to have HIV, hepatitis B or hepatitis C, you should receive specialist help and advice to conceive.

### *Couples where the man is HIV positive*

For a man who is HIV positive it is possible for you to conceive with an HIV-negative woman through unprotected sexual intercourse under specific circumstances.

If you are taking HIV drugs known as HAART (highly active anti-retroviral therapy) the risk of infection during intercourse is minimal as long as all of these conditions are met:

- You are taking your HIV drugs correctly.
- Blood tests show that the virus has been undetected (called having an undetectable viral load) in your body for the past 6 months.
- You have no other infections.
- Unprotected sexual intercourse is limited to the time of the month when the woman is ovulating. Your doctors can help you determine the best days to try.

It is very important still to use protection during the times when you are not trying to conceive, to minimise the risk of passing on the infection.

If virus is detected in your blood, you are not taking your HIV drugs correctly, or you and your partner do not want to have unprotected sexual intercourse, you may instead be offered 'sperm washing'. This involves separating the sperm from the semen, which reduces the chance of transmission because HIV is carried by the semen. The sperm is then used for [intrauterine insemination](#) or [IVF](#).

If you can meet all the conditions in the list above, sperm washing may not reduce the risk of HIV infection any further – it is never possible to guarantee that the sperm is completely free from the virus. Sperm washing may also reduce the likelihood of becoming pregnant compared with natural conception.

If you can meet all the conditions in the list above, NICE does not recommend also using 'pre-exposure prophylaxis', in which an HIV-negative woman takes antiretroviral drugs to reduce her risk of getting the virus before having unprotected intercourse with a man who is HIV positive. This is because it has not been found to reduce the risk of infection any further.

Before you make any decisions about trying to conceive you should be offered the chance to have a discussion with both a HIV specialist and a fertility specialist.

### *Couples where one partner has hepatitis B*

Hepatitis B is a virus which can infect and damage the liver. If one of you has hepatitis B, your partner should be offered hepatitis B vaccination because the illness can be passed on through unprotected sexual intercourse. For men with hepatitis B, you should not be offered sperm washing before having fertility treatment.

### *Couples where the man has hepatitis C*

Hepatitis C is another type of hepatitis virus which also infects the liver. In couples where the man has hepatitis C and the woman does not, the risk of infecting your partner during unprotected sexual intercourse is thought to be low. However, you should have the opportunity to talk to both a fertility specialist and a hepatitis specialist before you make any decisions about trying to conceive. For men, this should include talking about treatment options to eliminate the virus from your body.

## Assisted reproduction

Assisted reproduction is the name given to treatments that can help you get pregnant without you having sexual intercourse. There are a variety of treatments, and what is suitable for you will depend on your own circumstances. The options include:

- intrauterine insemination (IUI)
- in vitro fertilisation (IVF)
- IVF with intracytoplasmic sperm injection (ICSI)
- the use of donor sperm (donor insemination) or eggs (egg donation).

These treatments are described in the sections that follow.

Other methods of assisted reproduction called gamete intrafallopian transfer (GIFT) or zygote intrafallopian transfer (ZIFT) are not recommended.

Certain forms of assisted reproduction (IUI, IVF, ICSI, donor insemination and egg donation) are regulated by law and their use is controlled by the Human Fertilisation and Embryology Authority (HFEA; [www.hfea.gov.uk](http://www.hfea.gov.uk)).

## Intrauterine insemination

Intrauterine insemination (IUI) is a type of artificial insemination in which sperm is placed inside the womb. Another type of artificial insemination is intracervical insemination (ICI), where sperm is placed at the cervix (the neck of the womb).

If you are using ICI you have a higher chance of pregnancy if you use fresh sperm (that has not previously been frozen). However, IUI gives you a higher chance of pregnancy than ICI even if previously frozen then thawed sperm is used.

You may be offered IUI if:

- you and your partner are unable (or find it very difficult) to have sexual intercourse, for example because of a physical disability

- you have a condition (such as a viral infection that can be sexually transmitted) that means you need specific help to conceive – for example, if you are having sperm washing before conception can take place
- you are in a same-sex relationship and have not become pregnant after 6 cycles of artificial insemination.

You should be offered unstimulated IUI, which means that you are not given fertility drugs to stimulate your ovaries during treatment. You should have your insemination timed around ovulation to give you the best chance of success.

If you do not become pregnant after 6 cycles of IUI, you should be offered fertility tests. If your test results are normal, you should be offered another 6 cycles of IUI before other treatments, such as IVF, are considered.

### *When intrauterine insemination should not be offered*

You and your partner should not usually be offered IUI in the following circumstances because it has not been found to increase your chances of getting pregnant:

- unexplained infertility
- a low sperm count or poor-quality sperm
- mild endometriosis.

In these circumstances, you should be advised to keep trying to conceive through regular unprotected sexual intercourse for a total of 2 years (this can include 1 year of trying before you had your fertility tests). After this time you may be offered IVF.

## **In vitro fertilisation**

In vitro fertilisation (IVF) is one of the main methods used to help people conceive. Treatment begins with stimulation of the ovaries and includes collecting eggs and sperm, fertilising the eggs outside the woman's body, and placing 1 or 2 of the embryos into the womb.

### *What is a full cycle of IVF?*

A full cycle of IVF is one in which 1 or 2 embryos produced from eggs collected after ovarian stimulation are replaced into the womb as fresh embryos (where possible), with any remaining

good-quality embryos frozen for use later (see [freezing embryos after IVF](#)). When these frozen embryos are used later, this is still considered to be part of the same cycle.

### *What are my chances of having a baby with IVF?*

For women, the chance of success with IVF depends partly on your age. The older you are, the less likely you are to have a baby.

IVF is more effective for women who have been pregnant or had a baby before. The chances of having a baby fall with the number of unsuccessful cycles of IVF you have already had.

If you or your partner drink more than 1 unit of alcohol a day this will lessen your chance of success through IVF. This may also be the case if you or your partner smoke. Treatment with IVF is also more effective for women who have a [BMI](#) between 19 and 30. For women, drinking caffeinated drinks also lessens your chance of success through IVF.

### *Who should be offered IVF?*

If IVF is a possible treatment for you, your doctor should first discuss with you the risks and benefits of IVF treatment, in line with the Code of Practice produced by the [HFEA](#) ([www.hfea.gov.uk](http://www.hfea.gov.uk)).

### **Women aged under 40 years**

If you are a woman aged under 40 you should be offered 3 full cycles of IVF if:

- you have been trying to get pregnant through regular unprotected sexual intercourse for a total of 2 years or
- you are using [artificial insemination](#) to conceive and you have not become pregnant after 12 [cycles](#) – at least 6 of these cycles should have been using intrauterine insemination.

However, if your tests show that there appears to be no chance of you conceiving naturally and that IVF is the only treatment that is likely to help, you should be referred straightaway for IVF.

Any previous cycles of IVF you have had (including cycles that you have paid for yourself) will count towards the 3 cycles you should be offered by the NHS. This is because the chances of having a baby fall with the number of unsuccessful cycles of IVF.



Your doctor should also take into account how you responded to any previous IVF treatment and what the outcome was when deciding how effective and safe further IVF would be for you.

If you turn 40 during a cycle of IVF, you can finish the current full cycle but you should not be offered further cycles. You will still be able to have any frozen embryos transferred from your most recent episode of [ovarian stimulation](#) since these count as part of the same full cycle.

## Women aged 40–42 years

If you are a woman aged 40–42 years you should be offered 1 full cycle of IVF if all of the following apply:

- you have been trying to get pregnant through regular unprotected sexual intercourse for a total of 2 years or you have not become pregnant after 12 cycles of artificial insemination (at least 6 of these cycles should have been through intrauterine insemination)
- you have never had IVF treatment before
- your fertility tests show that your ovaries would respond normally to fertility drugs
- you and your doctor have discussed the risks of fertility treatment and pregnancy in women aged 40 years or older.

If your tests show that there appears to be no chance of you conceiving naturally and that IVF is the only treatment that is likely to help, you should be referred straightaway for IVF.

## Before starting IVF

Before you start IVF, you should both be offered tests for HIV, hepatitis B and hepatitis C. This is to reduce the risk of passing these infections on to any resulting children or to other people. If you test positive for any of them, you should be offered appropriate treatment and counselling.

## *Information about long-term risks of IVF*

More research is needed on the long-term safety of IVF. The long-term health risks to children born as a result of IVF treatment are low, but in women who have had IVF there may be a small increased risk of developing borderline ovarian tumours in the future. Before you start IVF, your doctor should give you up-to-date information about the long-term risks. They should also limit the drugs used for [ovarian stimulation](#) in IVF treatment to the lowest effective dose and length of use.

## What happens in IVF?

Different combinations of fertility drugs can be used in IVF. Your doctor should explain the benefits, risks and side effects of each treatment and assess your risks individually before deciding which drugs to offer you.

### *Pre-treatment*

You may be offered the oral contraceptive pill or progestogen tablets before IVF. This makes it easier to time when you need to start taking fertility drugs (because your doctor will know when your period is due). Taking the pill in this way does not mean you are less likely to have a baby.

### *Step 1: down-regulation of the ovaries*

Depending on the type of treatment you are having, you may be offered drugs called gonadotrophin-releasing hormone agonists to 'switch off' egg production in your ovaries. These drugs make the ovaries more receptive to the gonadotrophins which are used later on to stimulate the ovaries into producing eggs. Down-regulation is not the only method used to control your cycle in IVF. Your doctor should explain which option would be most suitable for you.

### *Step 2: ovarian stimulation*

Ovarian stimulation involves taking hormones to help your ovaries produce more than 1 egg at a time (unlike your natural cycle). You should be offered IVF with ovarian stimulation, as this gives you a better chance of pregnancy than IVF using your natural cycle (where 1 egg is collected during your normal menstrual cycle without the use of hormones). You should not be offered 'natural-cycle IVF'.

Gonadotrophins are used to stimulate the ovaries to produce extra eggs in IVF. These are the same drugs that may be used to help produce eggs if you do not ovulate normally.

You should be offered a hormone called human chorionic gonadotrophin (hCG) to help your eggs mature so they are ready to be collected. You should be offered monitoring by ultrasound throughout your ovarian stimulation to check how your ovaries are responding and to check for signs of ovarian hyperstimulation syndrome.

### *Step 3: egg collection*

Your eggs should be collected through a needle, guided through your vagina by ultrasound. You should be given an injection to relieve any pain and to make you sleepy during this procedure.

### *Step 4: obtaining sperm*

Men should usually be asked to produce a sperm sample if possible on the same day as the woman's eggs are collected.

If you have a condition (such as a spinal cord injury) that prevents you from ejaculating, there are treatments that may help you. Otherwise you may be offered surgical sperm recovery.

If your sperm count is low or the sperm are poor-quality, you and your partner may be offered further procedures as well as IVF. They are intracytoplasmic sperm injection and donor insemination.

### *Step 5: fertilisation of the eggs*

Once eggs and sperm have been collected, they are mixed together and placed in an incubator. The sperm may then fertilise some of the eggs. Any resulting embryos are kept in the incubator for up to 6 days before they are placed into the woman's womb.

### *Step 6: transfer of embryos*

Placing more than 1 embryo in your womb increases your chances of becoming pregnant but it also increases the risk of multiple pregnancy. Your doctor should make sure you are aware of this risk. You should not have more than 2 embryos transferred at one time.

The decision to transfer 1 or 2 embryos is based on your age, the quality of the embryos, and whether you have had unsuccessful IVF cycles previously. Younger women usually have better-quality embryos. This improves the chances of pregnancy. If you are using donor eggs it should be the donor's age rather than your age that is used to help judge embryo quality.

The table below gives a guide to how many embryos you should have transferred, based on your (or your egg-donor's) age.

## How many embryos should be transferred?

Your age	Treatment cycle		
	First full cycle	Second full cycle	Third full cycle
Under 37 years	1 embryo	1 embryo if a top-quality one is available; otherwise 2 embryos may be considered	No more than 2 embryos
37–39 years	1 embryo if a top-quality one is available; otherwise 2 embryos may be considered	1 embryo if a top-quality one is available; otherwise 2 embryos may be considered	No more than 2 embryos
40–42 years	2 embryos may be considered	–	–

The doctor should use ultrasound to guide the placement of the embryo into your womb. You do not need to stay in bed for long after the embryo transfer as this has not been shown to make any difference to the chance of pregnancy.

After IVF you should be offered progesterone to help the embryo to attach inside the womb. If you become pregnant, you do not need to take progesterone for longer than 8 weeks after conception.

### *Freezing embryos after IVF*

After your embryo transfer, if there are any remaining good-quality embryos, you should be offered the chance to freeze them for possible use later.

An embryo that has been frozen can be thawed and transferred into your womb either as part of your natural cycle or as part of a cycle controlled by hormone treatment. If you ovulate regularly, your chances of a successful pregnancy after thawed embryo transfer are similar whether your cycle is natural or stimulated.

## Intracytoplasmic sperm injection

For some men, their sperm are not capable of fertilising eggs in the usual way. If this is the case, you and your partner may be offered a procedure called intracytoplasmic sperm injection (ICSI), in which a single sperm is injected directly into an egg.

You should only be offered ICSI if:

- there are few sperm in your semen or they are of poor quality or
- there are no sperm in your semen (either because of a blockage or another cause) but there are sperm in your testes which can be recovered surgically or
- you have already tried IVF but there was poor or no fertilisation of the eggs.

In these situations, ICSI increases the chance of fertilising eggs compared with IVF used on its own. However, it doesn't make any difference to whether this will lead to a successful pregnancy.

If you are not able to ejaculate it is possible to obtain your sperm using surgical sperm recovery. You should be offered the chance to freeze some of your sperm for possible use later.

Before you consider ICSI, your doctor should offer both of you appropriate tests and discuss the results and their implications with you. They should also consider whether a genetic problem could be affecting sperm production. For some men, fertility problems result from a gene defect on their Y chromosome (the male sex chromosome). If your doctor knows or suspects that you have a specific gene defect they should offer you appropriate genetic counselling and tests.

If your sperm quality is very poor or you don't have sperm in your semen because of problems with sperm production, you should be offered a test known as karyotyping. This checks for abnormalities in your chromosomes. You should be offered genetic counselling about the possible results of this test.

## Donor insemination

This involves using sperm donated by another man. As a couple, you may decide to consider donor insemination as an alternative to intracytoplasmic sperm injection (ICSI). Your doctor should offer you both options and explain the advantages and disadvantages of each. Donor sperm can be used for IVF if necessary.

You should be offered donor insemination if:

- there are few sperm in your semen or they are poor-quality and you have decided against having ICSI or
- you have no sperm in your semen.

You may also be offered donor insemination if you have a genetic disorder that could be passed on to any children, an infectious disease that could be passed to the woman or to any children, or if you and your partner's blood groups are not compatible.

If you are considering donor insemination you should be offered independent counselling about the implications for you and any children you may have. All potential sperm donors should also be offered independent counselling to help them think about the implications of donation for themselves, their own children and any children they may have as a result of donating sperm.

For women, before you start treatment using donor insemination you should be offered tests to confirm that you are ovulating. You should be offered tests to check your fallopian tubes if there is anything about your medical history that suggests they may be damaged.

If you are ovulating regularly, you should be offered at least 6 cycles of donor insemination. To reduce the risk of multiple pregnancy you should be offered 'unstimulated' insemination, which means that you are not given fertility drugs to stimulate your ovaries during treatment. You should have intrauterine insemination rather than intracervical insemination because this gives you a higher chance of becoming pregnant.

If you have not become pregnant after 3 cycles of donor insemination, you should be offered tests to check your fallopian tubes if these have not been done earlier.

## Egg donation

Some women cannot produce eggs, usually because their ovaries are not functioning or have been removed. If you are in this situation, you may wish to consider receiving egg donation – that is, using another woman's eggs – to get pregnant.

You should be offered this option if:

- your ovaries have stopped working early, or after chemotherapy or radiotherapy or
- you have a chromosome abnormality, such as Turner syndrome or
- your ovaries have been removed.

You may also be offered this option if you have not had success with IVF or there is a high risk of passing on a genetic disorder to your children.

If you are considering receiving egg donation, you should be offered independent counselling to talk over what the treatment will mean for you, any children you already have, and any children you might have as a result of treatment.

## *Donating your eggs*

If you are considering donating your eggs, your doctor should offer you information on the risks associated with [ovarian stimulation](#) and egg collection. All potential egg donors should be offered the chance to see an independent counsellor to help them think about the implications of donation for themselves, their own children and any children they may have as a result of donation.

Occasionally a woman having fertility treatment can choose to donate some of her eggs in return for a benefit such as discounted IVF. Her eggs are then donated to a woman who is unable to produce her own eggs. This is sometimes referred to as 'egg sharing'. Anyone who is considering taking part in such a scheme should be offered the chance to see an independent counsellor to talk over what it will mean for them.

## **Freezing sperm, eggs or embryos before cancer treatment**

[Sperm](#), [eggs](#) or [embryos](#) can be frozen and stored for possible use in the future. This is known as cryopreservation. Cryopreservation of sperm, eggs or embryos may be a possible option for people who have been diagnosed with cancer, if the cancer treatment is likely to cause infertility.

If you are diagnosed with cancer, you should be given the opportunity to discuss your diagnosis and the effect of cancer treatment on your fertility, both with your cancer team and with a fertility specialist.

The decision to freeze some sperm, eggs or embryos depends on several things, including the type of cancer you have, your treatment plan and how quickly your treatment needs to start. Your healthcare team should also take into account whether future fertility treatment is likely to be successful, and whether the stored sample will still be usable when you are likely to need it. You should be able to have your frozen sample stored for at least 10 years.

The criteria for having fertility treatment that have been described throughout this information do not apply to people who have been diagnosed with cancer and wish to use cryopreservation to preserve their fertility. However, if you need to use your frozen sample in the future, these criteria will apply if you are having your treatment in the NHS.

## *Sperm*

If you are a man or adolescent boy you should be able to have a sperm sample frozen before your cancer treatment begins. Storage of your sperm should continue beyond 10 years if you are still at risk of fertility problems after this time.

## *Eggs and embryos*

Women (and adolescent girls, if appropriate) who are well enough to have [ovarian stimulation](#) and egg collection should be offered either egg or embryo storage, depending on which is most suitable, before cancer treatment begins.

You and your healthcare team should discuss whether there is enough time to have this procedure before your cancer treatment needs to start (the egg collection process can take several weeks), taking into account whether it may worsen your condition or outlook.

## **Questions to ask**

These questions may help you discuss your condition or the treatments you have been offered with your healthcare team.

## *Fertility problems*

- Can you explain more about how my age affects my fertility?
- Are there any useful national or local support organisations I could contact about fertility problems?
- Can you provide some written information for me about fertility problems and their treatment?
- What fertility treatment might I be able to have on the NHS?
- How do I face the uncertain future and make a plan for the outcome of my fertility treatment – whether that's by having a child or accepting that I won't?

## *Fertility tests*

- When and where can these fertility tests be carried out, and how long does it take to get the results?



- Can we still conceive naturally despite a low sperm count?
- Can you explain more about the different tests for examining the fallopian tubes and which one I will need?
- What happens next if no problems are found in our fertility tests?

## *Treatments*

### **General**

- Can you tell me why you have decided to offer me this particular type of treatment?
- What are the pros and cons of this treatment?
- What will it involve?
- Are there any risks associated with this treatment?
- What are my options for taking treatments other than the one you have offered me?
- Is there some other information (like a leaflet, DVD or a website I can go to) about the treatment that I can have?

### **Treating the causes of fertility problems**

- I am unable to ejaculate: can you explain the treatment options available to help me?
- I have an ovulation disorder: can you explain which type of ovulation induction treatment would be most suitable for me?
- What are my chances of having a multiple pregnancy with this treatment?
- Can you explain more about laparoscopic ovarian drilling and whether this may help me?
- If I have endometriosis can I still conceive naturally? What are the treatment options to help me?
- Is there any treatment we can try for unexplained infertility?

### **Intrauterine insemination**

- If the man's sperm count is low would IUI help us to conceive?

- Can you explain more about the procedures involved in using donor sperm for IUI?

## IVF treatment

- What are my chances of having a baby through IVF?
- Can you explain more about the relative merits of using ICSI or donor insemination?
- Can you tell me about the risks of fertility treatment and pregnancy in women aged over 40?
- How many embryos should I have transferred?
- Can you explain more about the risks of multiple pregnancy?
- Can you give me more information about the long-term risks of IVF?
- Can you give me some other information (like a leaflet, DVD or a website I can go to) about IVF?
- If IVF doesn't work can we choose to try IVF with ICSI?
- Are there any long-term safety risks of using ICSI?

## *Freezing sperm, eggs and embryos*

- Should I delay my cancer treatment long enough to have my eggs or embryos collected for cryopreservation?
- If I do not have my eggs or embryos collected what are my likely options in the future for having children?
- Will having my eggs collected make my illness worse?

## Terms explained

### *Artificial insemination*

A procedure that involves directly inserting sperm into a woman's womb or cervix (the neck of the womb) to help her conceive.

## *Assisted reproduction*

Treatments that enable people to conceive without having sexual intercourse. Methods include [intrauterine insemination \(IUI\)](#), [in vitro fertilisation \(IVF\)](#), [intracytoplasmic sperm injection \(ICSI\)](#), [donor insemination](#) and [egg donation](#).

## *Body mass index (BMI)*

The measurement used to define the range of healthy weight. Your BMI is calculated by dividing your weight in kilograms by your height in metres squared (that is, your height in metres multiplied by itself).

## *Chromosome*

A thread-like structure found in cells that contains a person's genetic information in the form of genes.

## *Cycle*

A single course of treatment. In IVF a 'full cycle' is one in which embryos produced from eggs collected after [ovarian stimulation](#) are replaced into the womb within a few days of their formation, with any remaining good-quality embryos frozen for use later. When these frozen embryos are used later, this is still considered to be part of the same cycle.

## *Egg*

The female reproductive cell. A woman usually produces 1 egg in a normal monthly cycle.

## *Embryo*

A fertilised [egg](#).

## *Fallopian tubes*

The pair of tubes leading from a woman's [ovaries](#) to her womb. The fallopian tube is where fertilisation of the egg by a sperm takes place in natural conception.

## ***Follicles***

A small sac in the ovary in which the egg develops.

## ***Gonadotrophins***

Hormones that a woman can take to stimulate her ovaries to produce eggs. They can be given during ovulation induction and ovarian stimulation. In men they can be used to stimulate sperm production.

## ***In vitro fertilisation (IVF)***

A technique by which eggs are collected from a woman and fertilised outside her body. One or 2 of the embryos created are then transferred to the womb. If one of them attaches successfully, it results in a pregnancy.

## ***Intracervical insemination***

A procedure in which sperm is placed into a woman's cervix (the neck of the womb) to help her conceive.

## ***Intrauterine insemination***

A procedure in which sperm is placed inside a woman's womb to help her conceive.

## ***Laparoscopy***

A 'keyhole' operation done under general anaesthetic, in which the surgeon uses a very small telescopic instrument (a laparoscope) to examine or operate on an area in a woman's pelvis.

## ***Multiple pregnancy***

A pregnancy in which the woman is carrying more than 1 baby. Multiple pregnancies carry higher health risks for both the mother and the babies.

## *Ovarian stimulation*

The use of gonadotrophins to stimulate the ovaries to produce more than 1 egg at once as part of IVF treatment.

## *Ovarian hyperstimulation syndrome*

A potentially serious condition that occurs when the ovaries 'over-react' to fertility drugs.

## *Ovaries*

Two small organs in a woman's reproductive system which produce follicles and eggs.

## *Ovulating*

See ovulation.

## *Ovulation*

The process by which the ovaries produce eggs. In a woman's natural cycle, ovulation occurs when a mature egg is released from the ovary each month.

## *Ovulation induction*

The use of fertility drugs to control or stimulate a woman's ovulation.

## *Semen*

The fluid containing sperm that is produced by a man during ejaculation.

## *Sperm*

The male reproductive cell, which fertilises a woman's egg.

## *Surgical sperm recovery*

A minor surgical procedure to obtain sperm from the testicles in men who cannot ejaculate or have a blockage in the flow of sperm from their testicles.

## *Ultrasound scan*

A scan that uses high frequency sound waves to provide images of the internal organs.

## Sources of advice and support

- Cancer Research UK, 0808 800 4040  
[www.cancerresearchuk.org/about-cancer](http://www.cancerresearchuk.org/about-cancer)
- Fertility Friends  
[www.fertilityfriends.co.uk](http://www.fertilityfriends.co.uk)
- Infertility Network UK (also includes ACeBabes and More to Life), 0121 323 5025  
[www.infertilitynetworkuk.com](http://www.infertilitynetworkuk.com)
- Stonewall (the lesbian, gay and bisexual charity), 0800 050 2020  
[www.stonewall.org.uk](http://www.stonewall.org.uk)
- Terrence Higgins Trust (HIV and sexual health charity), 0808 802 1221  
[www.tht.org.uk](http://www.tht.org.uk)

You can also go to [NHS Choices](http://www.nhs.uk) or the Human Fertilisation and Embryology Authority (HFEA) website ([www.hfea.gov.uk](http://www.hfea.gov.uk)) for more information about fertility problems.

NICE is not responsible for the quality or accuracy of any information or advice provided by these organisations.

## Update information

**September 2017:** Replaced the section on endometriosis with a link to the new NICE guideline on [endometriosis](#).

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## Accreditation

