



Baby Blues

*All You Need to Know
About Infertility*

Infertility is defined as the inability to conceive after 1 year of trying. Within the first year, 80-90% of couples should have conceived. Around 1 in 7 couples may suffer from fertility problems. Usually one-third of infertility cases arise due to problems in the woman, while one-third of cases can be attributed to problems in the man. The remaining cases may be due to issues present in both the woman and the man. And in certain cases, no obvious cause may be found.

PEOPLE AT RISK OF INFERTILITY

There are certain people who may be more at risk to infertility issues than others. These people include:

- **WOMEN WITH MENSTRUAL PROBLEMS:** Women who have irregular or painful periods may be at risk of fertility problems. If a woman has a history of irregular periods, this could indicate an ovulation problem where the egg is not released from the ovary regularly every month and will reduce her chances of conception. If she has painful periods, this may indicate the presence of a gynaecological problem such as endometriosis, ovarian cysts or fibroids, which may prevent the implantation of a healthy embryo in the uterus.
- **WOMEN WITH PAST MEDICAL OR SURGICAL HISTORY:** A past history of infection resulting in pelvic inflammatory disease (PID) or previous surgery may cause tubal disease which would prevent the egg and the sperm from meeting.
- **PEOPLE WITH POOR DIET AND LIFESTYLE CHOICES:** Smoking, alcohol use, being overweight or underweight can all affect fertility.
- **PEOPLE OF ADVANCED AGE (OVER 35 YEARS):** Age is a major factor, especially for women. Other factors include a person's general state of health, diet and lifestyle. For women, fertility steadily declines with age. Women are born with a fixed number of eggs. With increasing age, there is a fall in the number of eggs left in the ovaries. The likelihood of conceiving falls from 20% a month in a fertile 30 year old woman to less than 5% at 40 years of age.

The term "ovarian reserve" refers to a woman's current supply of eggs and is closely associated with reproductive potential. In general, the younger the woman, the higher the ovarian reserve. With a greater number of remaining eggs, the chances for conception also become better. Conversely, a low ovarian reserve greatly diminishes a patient's chances for conception.

Measuring the ovarian reserve is possible and useful in the evaluation of infertility patients. The tests currently available for assessing ovarian reserves include:

- Ultrasound scans of the ovaries to assess the "follicle count"; and
- Blood tests for female hormones, such as the Anti-Mullerian Hormone (AMH), a hormone produced by the eggs in the ovaries. As the number of eggs falls, there is a concurrent decrease in the AMH levels. AMH

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can, therefore, be measured to give an indication of the ovarian reserve.

When results indicate a poor reserve, a patient may be counselled that her window of opportunity to conceive may be shorter than expected and she should attempt to conceive sooner rather than later, or consider fertility treatment earlier.

SEEKING PROFESSIONAL HELP

After one year of trying, if a couple has still not conceived, further investigations are warranted. However, couples should seek advice earlier if they have the abovementioned risk factors for fertility problems. They should also seek advice earlier if they are of an older age group, especially in cases where the woman is over 35. Such couples should be referred to a fertility specialist after six months of trying to get pregnant.

In view of the impact of age, early diagnosis and treatment are crucial to the successful management of infertility.

TREATMENTS FOR INFERTILITY

Infertility can be treated based on the cause. Some common causes and their treatments include:

HORMONAL PROBLEMS: Hormonal problems can result in failure to ovulate. Symptoms of lack of ovulation include irregular cycles.

TREATMENT: This depends on the underlying type of hormonal problem which will then be treated accordingly. Sometimes, treatment of the underlying problem will result in normalization of the ovulation cycle. To induce ovulation, fertility drugs or hormone injections may be used. These help to enable ovulation to occur in a more predictable manner. Ultrasound scans may also be performed in the clinic to help determine more precisely when ovulation will occur. Urine tests to measure the presence of a luteinizing hormone (LH) surge, which occurs before ovulation, can be useful to time ovulation.



ENDOMETRIOSIS: This is a condition where the lining of the uterus is deposited outside the uterine cavity, possibly around the ovaries, resulting in the development of ovarian cysts. Symptoms include severe menstrual pain and pain during intercourse. Endometriosis also decreases pregnancy success rates due to the inflammation around the uterus and ovaries.

TREATMENT: Treatment options include hormone medication to suppress endometriosis or surgery. During surgery, laparoscopy and cystectomy with ablation of endometriotic lesions can be performed. Laparoscopy involves insertion of a fine telescope through the umbilicus, and the use of long and slim instruments. The skin incisions are very small at around 5mm and recovery is usually fast.

UTERUS IRREGULARITIES: Uterine irregularities may prevent the embryo from implanting well inside the uterus. Problems include the presence of a septum, which is a band of excess tissue which divides the uterus; large fibroids; and endometrial polyps.

TREATMENT: The treatment will depend on the nature of the problem. Surgery with hysteroscopy may be performed to treat the problem. This involves insertion of a fine telescope through the vagina into the uterus. The uterine cavity can then be cleared to optimize conditions for implantation of the embryo.

POORLY FUNCTIONING FALLOPIAN TUBES: The fallopian tubes may be damaged, and prevent the sperm and egg from meeting. Causes of tubal damage include a past history of pelvic infection or previous surgery, which can cause inflammation and scarring of tubes. Sometimes, the fallopian tubes may not have formed normally during development. A damaged tube can also lead to ectopic pregnancy where the embryo sticks inside the tube instead of implanting in the uterus.

TREATMENT: Treatment depends on the severity of the tubal damage. Sometimes, surgery may help to unblock the tubes. However, if a tube is badly damaged and swollen, it may need to be removed as it can cause a decrease in the pregnancy success rate of fertility treatments.

POOR SPERM COUNT AND QUALITY: Sperm production, quality and mobility can be affected by the general health of the man. Medical illness and medication can affect the sperm. Unhealthy diets and lifestyles can also affect the sperm.

TREATMENT: Treatment depends on the man's sperm count and sperm quality. Ultimately, assisted reproductive methods such as intra-uterine insemination (IUI) or in-vitro fertilisation (IVF) can help bypass male factor infertility issues.

INTRA-UTERINE INSEMINATION (IUI)

Intra-uterine insemination (IUI) is a more “natural” form of fertility treatment. IUI may be considered if the fallopian tubes are both healthy with no blockages, and there are at least 1 million motile sperm on semen analysis.

IUI involves the preparation of a semen sample and injection of the sample directly into the uterus using a fine catheter. The IUI process helps to “wash” the sperm so that the more motile sperm is obtained for injection into the uterus. It also helps to bring the sperm closer to the egg, bypassing the vaginal and cervical mucus factors that may prevent the sperm from swimming into the uterus.

IUI success rates are around 15% per cycle, comparable to trying naturally if there are no fertility problems. However, it is lower compared to IVF.

IN-VITRO FERTILISATION (IVF)

In-vitro fertilisation (IVF) refers to the use of laboratory techniques to bring the egg and sperm together outside of the woman's body. IVF is well established as the most effective mode of fertility treatment, particularly where the female fallopian tubes are blocked and/or the male sperm count is low. By bypassing the potential problems that prevent fertilization of the egg with the sperm at the microscopic level, IVF helps to provide the highest pregnancy success rate for a couple.

A couple may be advised to consider IVF earlier if the woman's fallopian tubes are blocked, preventing natural conception, or if the sperm count and quality of the man are very poor. A couple may also be advised to consider IVF if the woman is in the older age group and/or has a limited ovarian reserve, and they wish to have a higher success rate than IUI.

IVF treatment involves several different steps. Firstly, in order to increase the number of eggs produced by the ovaries, the woman has to undergo hormonal injections. Secondly, ultrasound scans and blood tests are needed to assess the growth and maturity of the eggs. Once the eggs are ready, they are retrieved with the help of a vaginal ultrasound while the woman is under anaesthesia. The eggs are then fertilized with the sperm in the laboratory to form embryos before they are transferred back into the woman's womb.

The success rate of IVF is mostly female age-dependent. Generally, the pregnancy success rate for IVF is around

50% for women under 40 years, but falls once the woman reaches 40 years and above. IVF success rate can also be affected by the presence of other gynaecological factors, such as endometriosis, ovarian cysts, uterine fibroids and polyps. Therefore, surgery may still be recommended in order to increase the IVF treatment success rate.

Developments in the field of IVF have allowed success rates to continue to improve. These developments include:

- Intra-cytoplasmic sperm injection (ICSI) for fertilization of eggs with sperm. This has helped to overcome fertilization failure in some couples, where the sperm is not able to penetrate and fertilize the egg.

- Embryo selection with blastocyst culture and time-lapse imaging of developing embryos with “embryo-scopes”. This allows for thousands of photos of developing embryos to be captured so as to pinpoint the healthy ones, which will then be implanted into the woman.

- Embryo freezing by vitrification is a rapid freezing method which allows embryos to be frozen more effectively, with less damage than traditional freezing methods.

- Embryo transfer using well designed embryo catheters under ultrasound scan guidance to determine the best location for the embryo to be placed.

- Embryo implantation support with progesterone pessaries, instead of daily intra- muscular injections.

- Fertility preservation: with the increasing incidence and prevalence of cancer, the issue of fertility preservation with the freezing of eggs, sperm or embryos has become very important.

LIFESTYLE CHANGES TO IMPROVE FERTILITY

Unhealthy lifestyle habits are another major factor that can adversely affect one's fertility and cause problems in conceiving. Some common lifestyle changes that can be adopted to improve fertility include:

- **STOP SMOKING:** Smoking impairs sperm quality and female smokers are more likely to experience earlier menopause before they hit 50 years old. This is due to the effects of tobacco toxins on the reproductive system.

- **LIMIT ALCOHOL INTAKE:** For women, there is no “safe” level of alcohol use during conception or pregnancy. Heavy drinking of seven or more drinks a week can harm fertility through its impact on liver and hormone functions. For men, heavy alcohol use can decrease sperm count and motility.

- **LIMIT COFFEE INTAKE:** Limiting to one/two cups of coffee a day can alleviate the effects of high levels of caffeine. More than 400mg of caffeine intake a day may be associated with decreased fertility and increased risks of miscarriage.

- **MAINTAIN A NORMAL WEIGHT:** Exercise, and eat a diet rich in fruits and vegetables. Ensure that you consume food rich in antioxidants.



For women, it is also recommended to take folic acid to prevent certain birth defects like spina bifida. It may also be useful to visit a doctor for a “preconception” check to review what can be done to optimize the chances of a successful pregnancy.

For men, it is recommended to wear loose-fitting undergarments. Men should also avoid places or facilities of extremely hot temperatures, such as hot tubs or saunas. High temperatures can affect sperm production and motility. **PRIME**



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Dr Loi is an Obstetrician and Gynaecologist who provides dedicated care for fertility, IVF patients and laparoscopic surgery. She graduated from the Oxford Medical School and is a member of the Royal College of Obstetricians & Gynaecologists, and fellow of the Academy of Medicine, Singapore. She is also a Singapore Ministry of Health authorised IVF Clinician. Dr Loi has served as a Consultant in the Department of Reproductive Medicine at KK Hospital. She was also actively involved in the teaching faculties of the Yong Loo Lin Medical School and the Duke Graduate Medical School. At the same time, her dedication to patients has won her Excellent Service Awards as well as the Long Service Award from KK Hospital in 2008. Dr Loi has authored numerous medical papers and has been invited to be a reviewer on peer-reviewed international medical journals on obstetrics & gynaecology.

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