IVF Treatment Information

April 2016

Fertility Plus, Greenlane Clinical Centre, Private Bag 92189, Auckland Telephone: 09 630 9810, Fax: 09 631 0728

Table of Contents

Welcome to Fertility Plus**.** This booklet is designed to help you understand all aspects of your In Vitro Fertilisation (IVF) treatment cycle.

Fertility Plus Personnel

There is a multidisciplinary team of staff at Fertility Plus who will care for you and co-ordinate your IVF treatment.

This team is comprised of:

Medical Director and Consultants
Nurses
Scientific Director
Embryologists
Administration Staff
Counsellors

Administration staff

You will be welcomed at the front desk to ensure your visit to the clinic runs as smoothly as possible. Our administration staff will be more than happy to help if further assistance is required. It is important for you to know that all patient information is treated with utmost privacy and confidentiality.

Nurses

Nurses are available by telephone for treatment bookings, instructions and blood results daily from 8.30 am – 3.30 p.m. There is a voice-mail service, so please leave a message and you will be phoned back as soon as possible. Staff will respond to an urgent message by the end of the day. Day one calls are considered non urgent and will be responded to in time for you to begin your treatment. You will be called on the day of a blood test to give you your result and instructions.

Embryologists

The embryologists carry out all procedures involving embryology (the care of eggs and embryos) and andrology (semen analysis and preparation). If you need to make an appointment for a semen analysis or have any questions regarding eggs, sperm or embryos you can phone the laboratory directly on (09) 630 9842.

Counsellors

There are counsellors available for support before, during and after treatment. If you have any concerns or issues you may wish to discuss you can arrange an appointment with a counsellor by phoning (09) 630 9810 extension 5.

Clinic opening hours

The clinic is open between 7.30 am - 4.30 pm Monday to Friday. At weekends and on public holidays the clinic is open as required.

For emergencies outside the clinic hours contact the Women's Assessment Unit at Auckland City Hospital on 09 631 0784

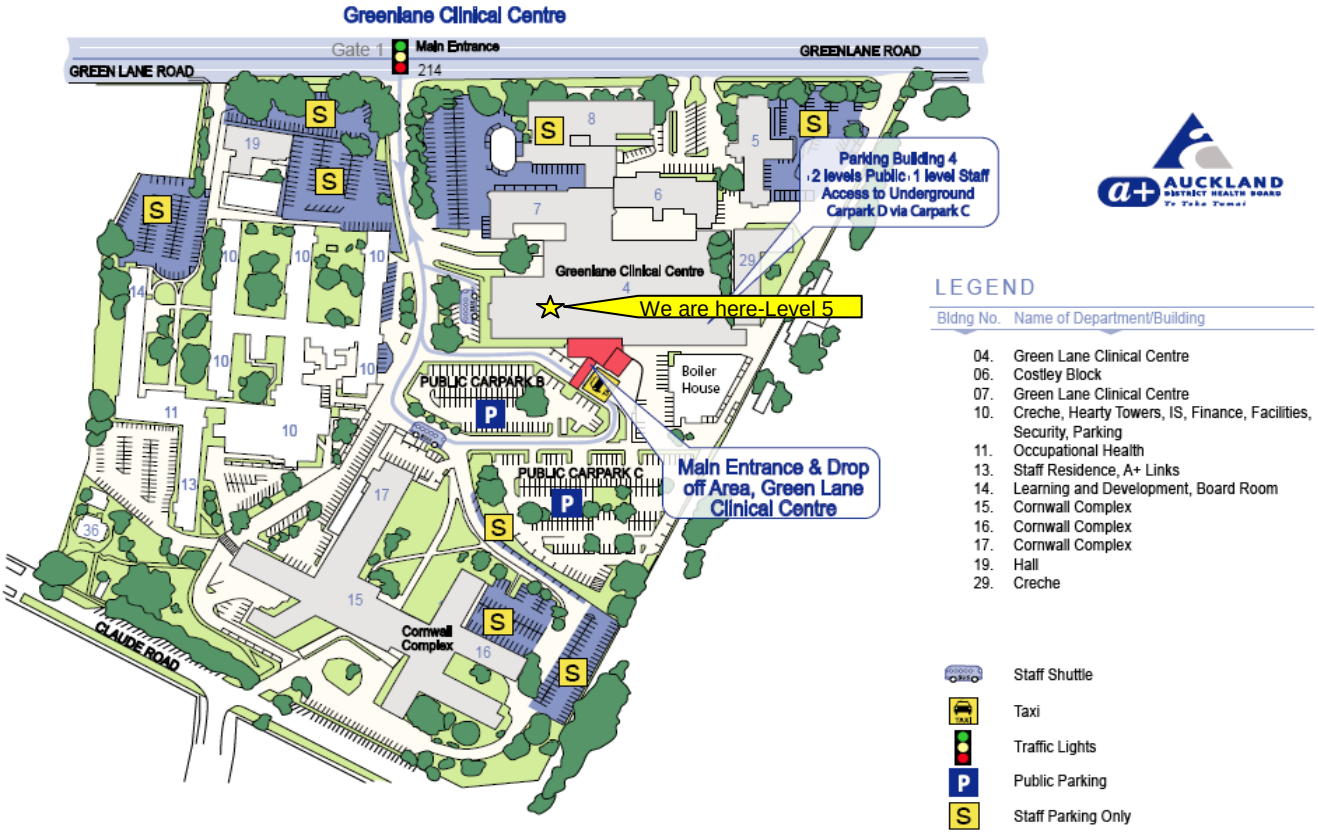
Address

Fertility Plus, Level 5, Building 4, Greenlane Clinical Centre, 214 Greenlane Road West, Epsom.
Private Bag 92-189, Auckland

Website

http://nationalwomenshealth.adhb.govt.nz

Map



Use the main entrance (Gate 1) to the Greenlane Clinical Centre off 214 Greenlane Rd West, opposite Alexandra Racecourse. Once inside the main entrance to Building 4, continue past the Pharmacy and Muffin Break to lifts A. Fertility Plus is located on level 5.

Introduction

Fertility Plus is the Fertility and Reproductive Endocrinology Department of National Women's Health, and also runs clinics for endometriosis, pelvic pain, male factor infertility and recurrent pregnancy loss. Our services are integrated with the general Gynaecology, Maternity and Medical services at National Women's Health, ensuring we can support all aspects of your fertility treatment and ongoing care.

Fertility Plus has been at the forefront of fertility treatment for 30 years. The first baby born as a result of IVF was Louise Brown in England in 1978. New Zealand's first IVF cycle was undertaken on July 23rd 1983 at Fertility Plus, National Women's Hospital and the first pregnancy occurred soon after. We offer treatment for both public and private patients.

Accreditation

Fertility Plus is an RTAC (Reproductive Technology Accreditation Committee) accredited fertility unit recognised internationally for providing IVF and many other fertility investigations and treatments. RTAC accredits fertility units in Australia and New Zealand.

Accreditation against a New Zealand standard is also required to monitor compliance with the HART Act 2004 (Human Assisted Reproductive Technology). A designated accrediting agency (DAA) annually inspects all New Zealand fertility clinics and accredits against the Fertility Standards 8181. The inspection team includes auditors and technical experts who need to access patient files to check accuracy of our reporting and ensure quality. The data from our patient files is used for assessment purposes and everything is undertaken in the strictest confidence.

Pregnancy and cycle data must also be sent to ANZARD (Australia and New Zealand Assisted Reproduction database) for audit purposes. Each record must have an identifier, and the NHI number is used, but no names are recorded.

Who may benefit from IVF treatment?

Tubal Infertility

IVF was originally developed to help women whose fallopian tubes are blocked and for whom surgery to overcome the blockage is not possible, or unsuccessful. It is now offered to patients with a number of causes of infertility, these are discussed in brief below.

Endometriosis

This is a condition when the tissue that lines the uterus (called the endometrium) is found outside of the uterus. The endometriotic tissue can be found on the ovaries, uterus, and nearby structures. It often causes lower abdominal pain and/or painful periods. This condition can be associated with infertility.

Male Factor

IVF combined with ICSI (Intra-cytoplasmic Sperm Injection) enables fertilisation of an egg to be achieved with a very low number of motile sperm. Ejaculated sperm or sperm surgically biopsied from the testicles can be used.

Unexplained Infertility

For some couples, despite undergoing extensive investigation we are unable to find an obvious cause for their infertility, this is called unexplained infertility.

Ovulatory Disorders

Where an egg is not released from the ovary (ovulation) despite the use of ovulation drugs.

Counselling

The Reproductive Technology Accreditation Committee requires all IVF providers to have access to a counselling service. Currently our policy is for all couples to attend a counselling session as part of their orientation. It is an opportunity to address any concerns you may have about treatment.

Counselling is also available to all couples at all stages of treatment. If you are having any difficulty making a decision about treatment or if you are concerned about the impact of treatment on your relationship, have had a successful or unsuccessful treatment or simply want to discuss what you are experiencing you can make an appointment with one of our counsellors.

Support

IVF and ICSI treatments are time consuming, expensive and at times stressful.
Our staff philosophy emphasises patient support - including support from our nurses, doctors and scientific staff.

A chaplaincy service is also offered by the hospital for all denominations. This is confidential and can be accessed at any stage of your treatment. A prayer or karakia can be performed. Please discuss this with one of the nursing staff if you wish for this to be arranged.

The ADHB aims to ensure that consumers receive services in a manner that recognises their cultural and individual beliefs and values. Fertility Plus ensures that Maori are supported to continue their cultural and traditional practices while receiving fertility services. We are supportive of whānau, hapū and iwi involvement in treatment, support, care plan and review.

In addition, there are infertility support groups throughout New Zealand. These organisations offer information and support for people experiencing infertility. Information about these organisations is found at the back of this booklet, along with a list of suggested reading material.

Family Violence

Women's Health at the ADHB is committed to helping women affected by family violence. You may be asked questions about this during your visits to Fertility Plus. Please contact Fertility Plus staff at anytime if family violence is an issue for you. Alternatively you can phone the helpline on 0508 744 633.

Private Cycle Payments

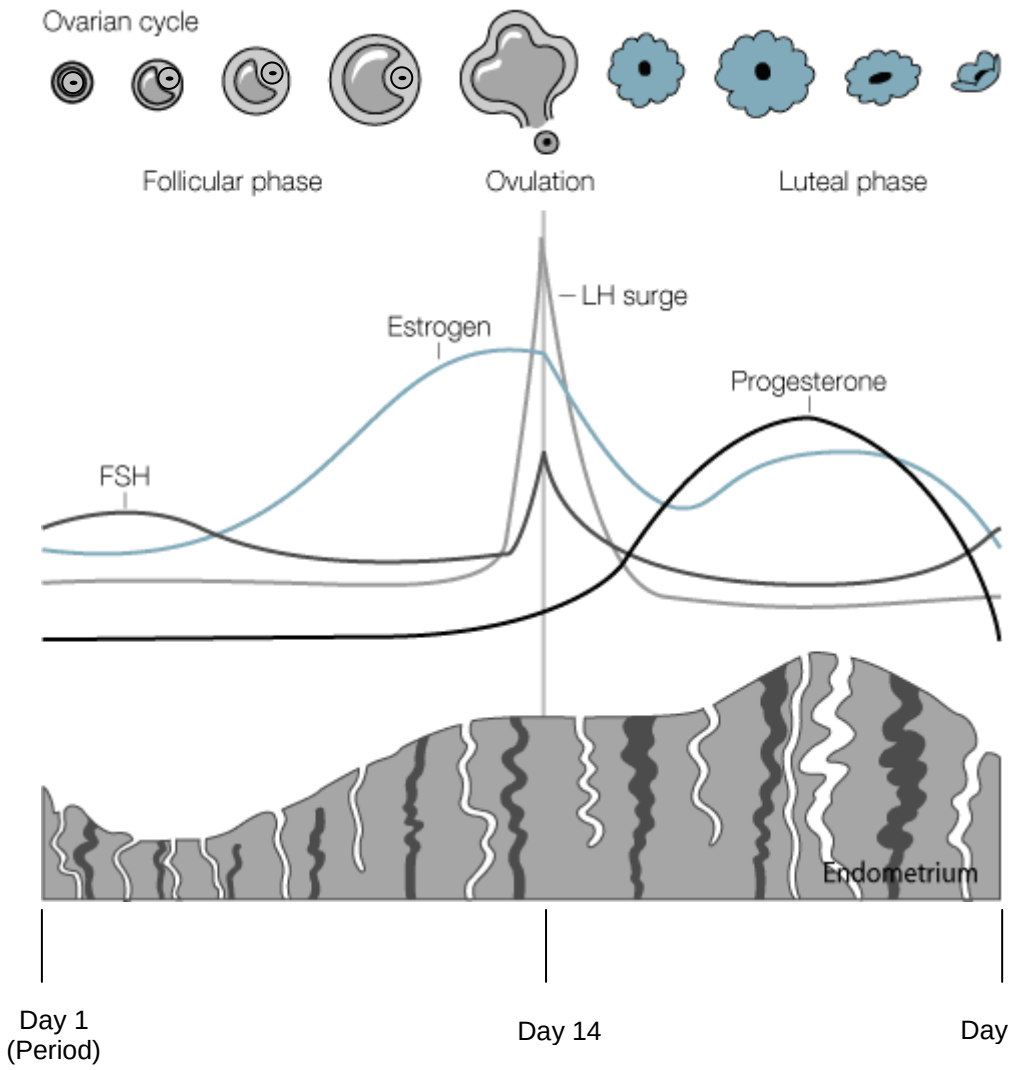
Patients who are ineligible for public fertility treatment and who are paying for private cycles need to pay their invoice prior to receiving treatment e.g. prior to insemination, embryo thaw or egg collection. Drugs are paid for when they are dispensed.

Menstrual Cycle

To help you understand how an IVF treatment cycle works, it is important to understand what happens in a natural monthly menstrual cycle.

Refer to the glossary at the back of this booklet to familiarise yourself with the medical terms used in this booklet.

Diagram of the menstrual cycle



The above diagram is an illustration of the menstrual cycle showing the ovarian, hormone and endometrial profile over the 28 day menstrual cycle. The ovarian cycle illustrates the development of a follicle with an egg maturing inside. Around day 14 the mature egg is ovulated from the follicle. The ruptured follicles function then changes; it becomes a Corpus Luteum which begins to secrete progesterone. The cycle of the hormones FSH, LH, estrogen and progesterone is shown. FSH stimulates the development of the follicle early in the cycle. As the follicle matures it secretes increasing amounts of estrogen (indication of egg maturity), estrogen stimulates the reconstruction of the endometrial lining after a period. When the estrogen reaches a certain level it will initiate a surge in LH. 36 hours following the LH surge the egg will be released during ovulation. The progesterone hormone level rises following ovulation (due to the corpus luteum) which prepares the lining of the uterus to receive an embryo. If an embryo does not implant, the progesterone level falls and a period will begin around day 28.

The menstrual cycle refers to the physiological changes which occur on a monthly basis in response to a pattern of changing levels of reproductive hormones. There are two important groups of hormones called gonadotrophins (Luteinising Hormone and Follicle Stimulating Hormone), which are produced and released by the pituitary gland in the brain, and ovarian hormones estrogen, estradiol and progesterone. The menstrual cycle is counted from the first day of a full fresh bleed (**Day 1**). The length of a woman's cycle is on average 28 days, however some woman experience shorter cycles and some longer.

The menstrual cycle is divided into two phases, the follicular phase and the luteal phase.

Follicular Phase

This is the first phase of the menstrual cycle starting from day one. During this phase egg development is stimulated and a mature egg is ovulated. The lining of the uterus is also stimulated to reconstruct and thicken after the last menstrual period.

An egg (oocyte) develops inside a bubble of fluid called a follicle which grows in size as the egg matures and develops.

Each month, a group of immature eggs are recruited to begin growing in a separate process called folliculogenesis. The eggs growing inside follicles can develop to a certain stage independent of reproductive hormones; however these hormones become essential in order for an egg to survive and develop to maturity.

The pituitary gland in the brain begins the menstrual cycle by releasing Follicle Stimulating Hormone (FSH) which initiates a response in the ovaries. Under the influence of this hormone a group of follicles is stimulated to continue growing and maturing. Only enough FSH is produced to allow one 'dominant' follicle to grow to full maturity, the rest will stop growing. When the follicle is mature and ready to be ovulated it is approximately 20 - 25mm in diameter. The egg itself is less than the size of a pinhead and is only just visible to the naked eye.

As the follicle matures it secretes increasing amounts of Estradiol (E_2). This hormone has two functions. Firstly it initiates the growth of a new endometrium (lining of the uterus) after the last period. Secondly, when the E_2 level reaches a certain level (indicating follicle/egg maturity) it initiates the rise in the Luteinising Hormone (LH). The release of the egg from the follicle will occur approximately 36 hours later and this is called **ovulation** (typically around **day 14**). The egg is released from the ovary and enters the fallopian tube where fertilisation occurs. If fertilisation is successful the resulting embryo (a fertilised egg) begins developing as it moves down the fallopian tube and into the uterus. The embryo enters the uterus on the fifth day of development where it then implants in the endometrium and begins to establish a blood supply.

Luteal Phase

This is the second phase of the menstrual cycle. After ovulation has occurred, the appearance and function of the ruptured follicle changes (it is now called a Corpus Luteum). The Corpus Luteum starts producing progesterone (P_4). This hormone prepares the endometrium to receive an embryo. If an embryo implants it will begin its own production of a hormone called Human Chorionic Gonadotrophin (hCG). If the level of this hormone does not continue to rise, two events will happen. Growth of the endometrial lining ceases and shrinks due to decreased blood flow, and the Corpus Luteum begins to deteriorate around Day 22, causing a fall in the progesterone level. Preparation to shed the endometrium begins, and a period occurs approximately five days later.

Overview of IVF / ICSI Treatment

IVF gives many infertile couples the best chance of achieving fertilisation and pregnancy. It involves stimulating the ovaries with a higher amount of FSH than your body naturally produces in order to stimulate more than one egg to develop to maturity. When the growing follicles reach the appropriate size the eggs are collected from the ovaries.

There is more than one protocol used to stimulate the ovaries in an IVF cycle. Fertility Plus currently uses two standard protocols:

1. **Long course Agonist Cycle** - The standard protocol currently used at Fertility Plus is a Long Course Agonist Cycle. This involves putting a woman's own hormonal cycle 'on hold', by a daily injection of a GnRH agonist (Buserelin), so that we can then artificially stimulate the cycle. This first stage is called 'down regulation' and takes approximately two weeks.

2. **Antagonist Cycle** - An Antagonist Cycle is a shorter stimulation cycle and does not require down regulation.

At your orientation the doctor will decide which type of stimulation you will receive.

If the response of your ovaries to FSH is expected to be low (low AMH, high FSH, advanced age, previous low response) you may be placed on a:

- **Low Responder protocol**, or,
- **Microdose Flare**

Details of these cycles will be given to you at the time of orientation.

Ovarian stimulation is then started with daily injections of a recombinant FSH hormone (either Puregon or Gonal-F).

In some cases a different protocol called an Antagonist cycle may be suggested. In this case the natural cycle is not down regulated with Buserelin. Ovarian stimulation is started with FSH (same as for the Long Course Buserelin cycle above). However a different drug called a GnRH antagonist (Cetrotide or Orgalutran) is used once stimulation has begun. This drug prevents the natural LH surge causing ovulation.

The growth and maturity of the follicles containing the eggs are monitored by blood tests and ultrasound scans. When the eggs are ready to be harvested, the LH surge is simulated by a 'trigger injection' (refer to 'Drugs used in Fertility' and 'Trigger injection'). The egg collection is scheduled for 36 hours after the trigger. The egg collection procedure will be explained in further detail in the following pages.

In Vitro Fertilisation (IVF) means fertilisation outside the body. After the eggs have been collected, sperm are added to them (this can be by standard IVF or ICSI which will be further explained in the laboratory section). The following morning the eggs are assessed for fertilisation. Embryos are then cultured for up to 6 days. One or two may be transferred back into the uterus 2-5 days following the egg collection. If there are any remaining good quality embryos on day 5 or 6 they can be frozen.

IVF Agonist Protocol – Long Course

Down regulation

This is achieved by daily injections of Buserelin from Day 21 of your menstrual cycle. Down regulation occurs when the blood estradiol and progesterone hormones drop to a very low level known as their baseline level. The hormone levels return to normal once administration of Buserelin is stopped. Occasionally if your menstrual cycle is shorter than 28 days, Buserelin maybe started on a different day (other than Day 21).

- A blood test is carried out two weeks later to confirm your hormones have decreased/down regulated, before starting the stimulation injections. **It is normal to have a menstrual bleed around this time.**

- If the hormone levels do not down regulate as expected, it may be necessary to have a scan and to continue administering Buserelin for a longer length of time before stimulation injections can begin. This usually means your egg collection will be delayed.

- When you are down regulated, daily Buserelin injections continue in conjunction with the stimulation injections until 'trigger' when the eggs are ready to be collected.

- Occasionally, if recommended by the doctor, a 'short course' Buserelin cycle may be suggested. This is where Buserelin is started on Day 1 and stimulation with Puregon or Gonal F on Day 2.

Ovarian stimulation – follicular phase

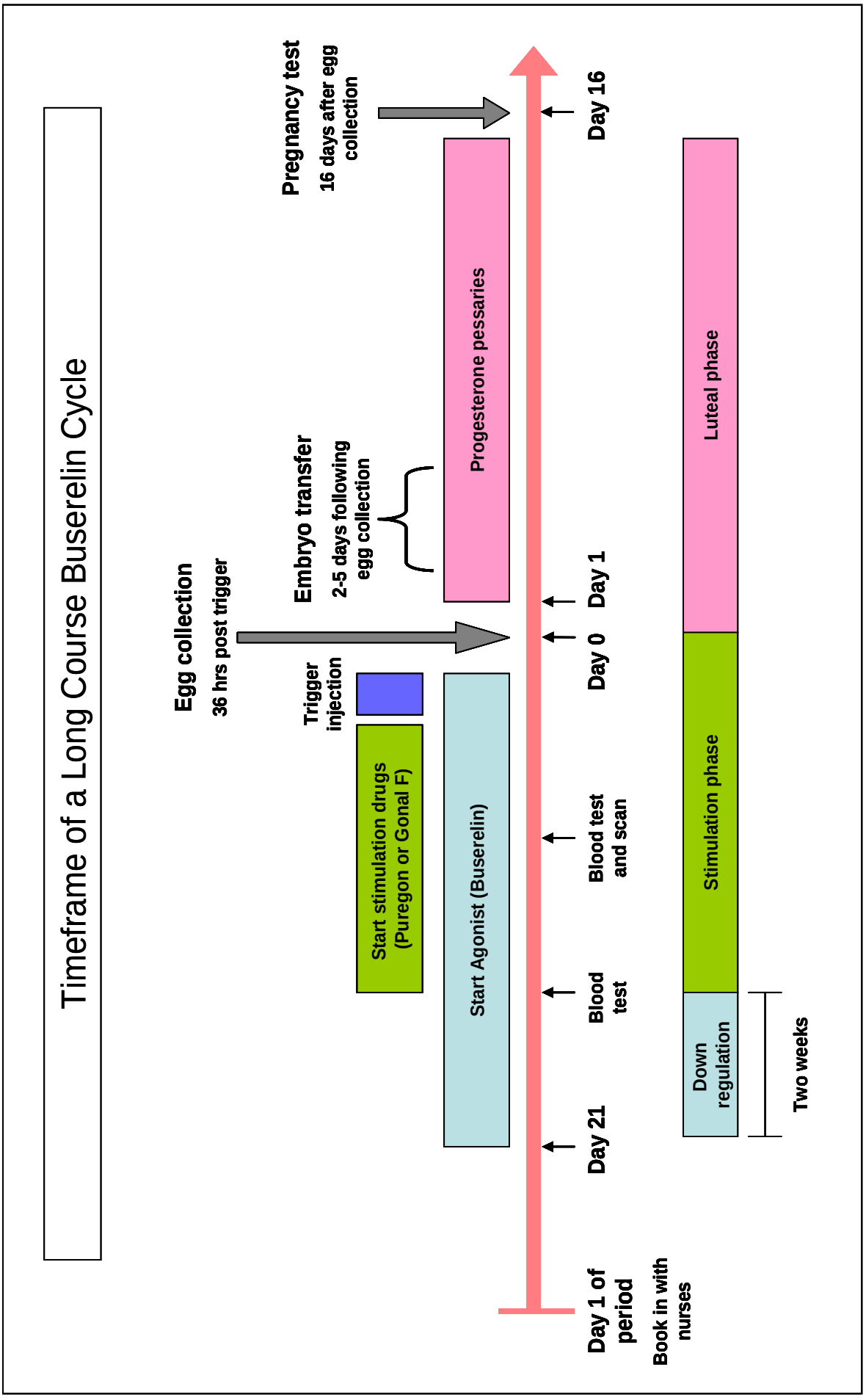
Day 1 of stimulation	Addition of the second daily injection, either Puregon or Gonal F.
Day 7 or 8 of stimulation	Blood test and an ultrasound scan, to monitor ovarian stimulation.
Day 9-11 of stimulation	Repeat Blood test and scan.

You will continue to administer daily Buserelin injections and Gonal F / Puregon injections as advised. A decision will be made as to when the eggs are ready to be collected and a time will be given for the trigger injection. Further blood tests and scans and/or blood test may be required before this decision is made.

- All patients respond differently to treatment and it is possible that your cycle may take longer than expected.

- If you reside outside of Auckland you may be able to have your blood tests and scans close to home.

Timeframe of an agonist/LCB cycle



IVF Antagonist Protocol

The antagonist protocol of ovarian stimulation is a shorter method of stimulating egg development. Instead of achieving down regulation by starting Buserelin on Day 21 and continuing for at least two weeks, the antagonist cycle does not require the natural hormone levels to be down regulated. Stimulation with daily Puregon or Gonal injections begins and once the follicles have reached a certain size, the antagonist drug (Orgalutran) is administered. This drug prevents a natural LH surge causing the follicles to ovulate. The two injections are taken in conjunction and continued until the day of trigger. You may be given the oral contraceptive pill (OCP) before starting the stimulation drugs in order to induce a bleed.

If using the OCP the nurses will advise you of the start and stop dates. You should expect a withdrawal bleed after you stop the OCP and before you start the FSH.

Ovarian stimulation – follicular phase

Day 1 of stimulation	The stimulation drug FSH (either Puregon or Gonal F), is taken at the prescribed dose in the evening.
Day 7 of stimulation	Blood test and scan. Providing the biggest follicle is 14mm, the antagonist drug is started and taken daily with the FSH.
Day 7-12 of stimulation	Repeat Blood test and scan.

You will continue to administer daily FSH (Gonal F or Puregon) injections as advised. When the biggest follicle is 14mm you will also begin daily antagonist (Orgalutran) injections. A decision will be made as to when the eggs are ready to be collected and a time will be given for the trigger injection. Further blood tests and scans may be required before this decision is made.

IMPORTANT: Contact with Nurses

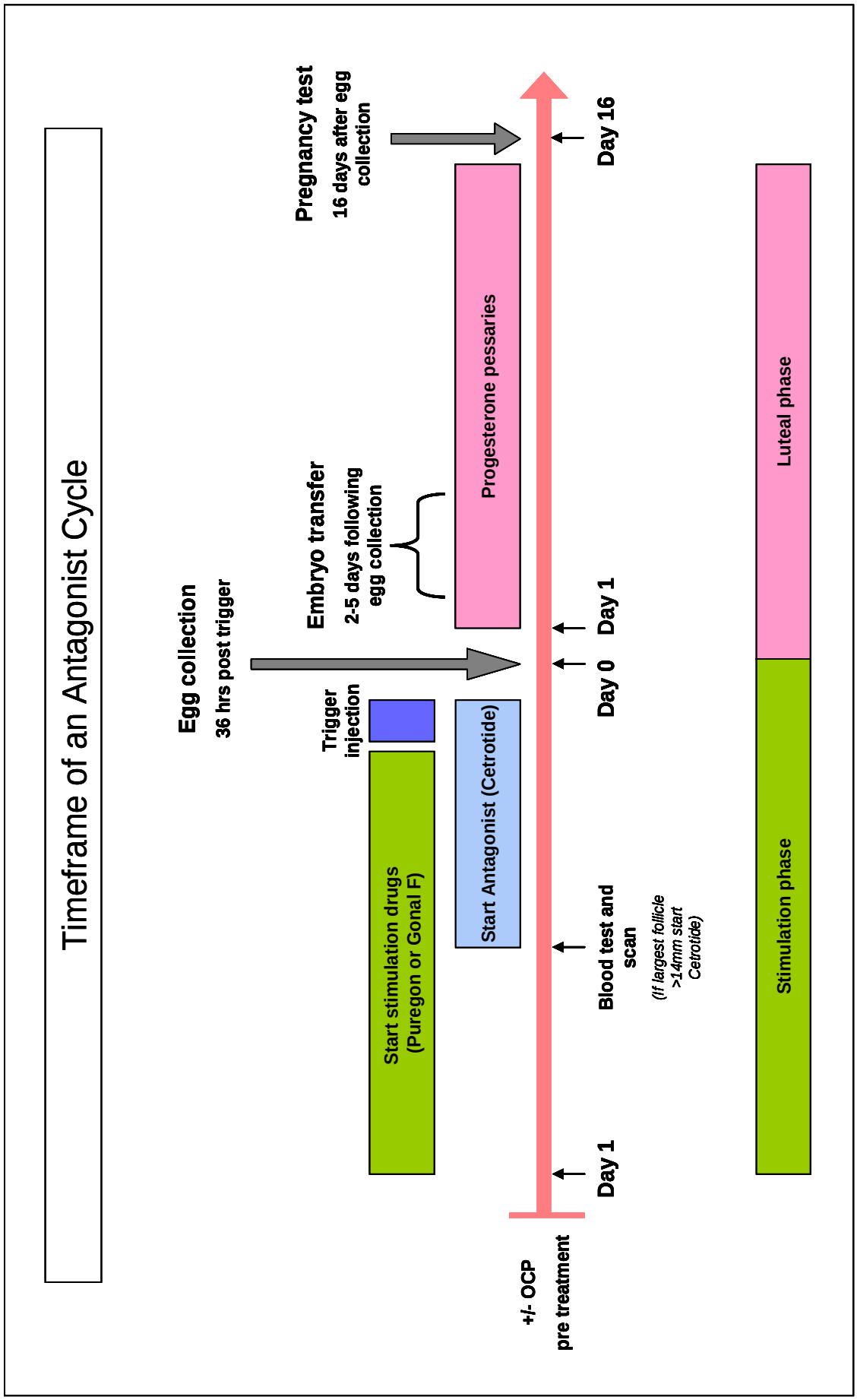
If you are having an OCP 'lead in' to your stimulation:

- Call nurses with your period (Day 1) the month **prior** to your 'treatment' month i.e. expected month of the egg collection. For example, if egg collection is May, call nurses with your April Day 1 – to commence OCP on Day 1 or 2.

- All patients respond differently to treatment and it is possible that your cycle may take longer than expected.

- If you reside outside of Auckland you may be able to have your blood tests and scans close to home.

Timeframe of an antagonist cycle



Trigger Injection

Once the follicles containing the eggs have grown enough for us to be able to harvest the eggs you will be given instructions to administer a trigger injection (Ovidrel). Occasionally, a different trigger injection is used for an antagonist cycle. If there are lots follicles developing on the ovaries you may be advised to have an agonist (Buserelin) trigger rather than Ovidrel in order to reduce the risk of OHSS, you will be advised if you require an agonist trigger.

The trigger injection creates an artificial LH surge to stimulate the final maturation of the eggs. This injection is administered 36 hours prior to your egg collection. Once the decision is made for when your egg collection will be, you will receive full instructions from a nurse regarding when to have your trigger injection.

The trigger injection will be your final injection.

Please **do not** have **unprotected** intercourse once you have had your trigger injection.

Egg Collection

You must have nothing to eat and drink from 6 hours before your egg collection however you may sip on water up until 2 hours before. You will be asked to take Panadol before coming in for the procedure which can be taken with a small amount of water. A nurse will give you full instructions prior to your egg collection.

- On the day of your egg collection do not wear any perfume or highly scented body lotion.
- You can not drive, operate machinery or make important decisions for 24 hours following the sedation that you will be given for your egg collection.
- Please ensure someone is available to drive you home and stay with you following this procedure. You may have your partner or other support person present during your egg collection.
- The male partner needs to provide a semen sample on the day (unless frozen sperm is being used). A period of 2-3 days abstinence is optimal.
- Samples are usually produced by masturbation in a private room at Fertility Plus but can also be produced at home and brought to the laboratory within one hour of ejaculation. The sample must be delivered by the male partner and photo identification is required.
- **If you wish to bring the sample from home please let the laboratory know on 09 630 9842**.
- Please bring your treatment consent forms, if not already signed.
- You may bring some music on a CD or a portable device (e.g. ipod) to listen to during the procedure and some socks if you wish.

What the procedure involves

A vaginal ultrasound probe, with a needle guide attachment is inserted into the vagina which has been “numbed” by local anaesthetic. Using the ultrasound scan for guidance, the follicles are visualised on the ultrasound screen and a needle is then pushed through the top wall of the vagina into the ovary. The fluid in each follicle is then drained and an embryologist will check the fluid for the presence of an egg. It is important to note that an egg is not always retrieved from every follicle.

Most people have this procedure performed under intravenous sedation, where a small needle is inserted into a vein and you are given some drugs that will make you feel relaxed (but will not put you to sleep), and some for pain relief. The procedure takes about 30 minutes. However, you will be required to remain at the clinic for up to 2 hours for rest and monitoring. If you are required to have this procedure performed under general anaesthetic, you will be instructed accordingly.

After your egg collection you may feel bloated or have abdominal pain and/or spotting. This is completely normal. If you have any concerns about pain or discomfort, please do not hesitate to discuss it with us prior to your egg collection. Very occasionally, women may experience significant bleeding following their egg collection (See 'Risks associated with associated with treatment').

"Freeze All" Cycles

Your doctor may recommend that you do not have a fresh embryo transfer, but that the laboratory freezes all your embryos. The most common reasons for this are:

- Risk of Ovarian Hyper-stimulation Syndrome (OHSS)
- Raised progesterone in your follicular phase.

This will be discussed with you at the time of trigger and/or egg collection. The embryologist will advise you of the number and stages of embryos that have been frozen. See **Embryo Freeze** in laboratory section.

Luteal Phase

Once you have had your egg collection you enter the second phase of your treatment cycle - this is known as the luteal phase. You will be given vaginal or rectal progesterone pessaries (Utrogestan) to begin using from the day after your egg collection (this is your **Luteal Day 1**). The pessaries are very important for preparing and supporting the endometrium for embryo implantation. Two pessaries need to be inserted three times per day into the vagina or rectum.

Embryo transfer

An embryo will be replaced into your uterus 2-5 days following egg collection. The embryologists will discuss the timing of your transfer with you after the fertilisation check.

It is a relatively painless procedure, and is similar to having a smear done. You will be asked to fill your bladder prior to the transfer, which helps ensure a clear view on the scan and helps to straighten out the uterus allowing for an easy transfer. You will need to drink 3 medium sized glasses of water an hour before your scheduled transfer.

The embryologist will load the embryo(s) into a fine plastic tube called a catheter in the laboratory. The doctor will pass the catheter from the vagina, through the cervix and the embryo is then released into the uterus. The catheter is checked by the embryologist to make sure that the embryo is not left in the catheter. After the embryo transfer procedure is complete you can get up straight away, the embryo will not 'fall out' as the internal walls of the uterus sandwich the embryo snugly.

In most cases this is a relatively painless procedure and is similar to cervical smear test. Patients will not be able to enter the laboratory to view their embryo(s) before replacement due to risk of contamination. If you wish to have a photo of your embryo you may ask for this prior to your transfer.

Single Embryo Transfer (SET) Policy

Fertility Plus has a policy of single embryo transfer. The principle of single embryo transfer is to give each single embryo that is transferred its maximum opportunity to implant and develop into a healthy pregnancy and to avoid all 'avoidable' multiple pregnancies. Even twin pregnancies carry a much greater risk for pregnant women and for the foetuses/babies than singleton pregnancies. There is also an increased financial risk with a multiple pregnancy.

The only exception to this single embryo transfer (SET) policy is for patients who have previously had 4 unsuccessful single embryo transfers. Patients wishing to have a double embryo transfer (DET) on their 5th replacement are required to have a booked consultation with a fertility doctor to discuss this.

It is important to note that twins can still arise from single embryo transfer (monozygotic twins).

Following your embryo transfer

Following the embryo transfer you will continue to use progesterone pessaries until your pregnancy test, if you have a positive pregnancy blood test then you will continue the pessaries until week 9 of pregnancy. These are vital in order to maintain the endometrium for implantation and also to support early implantation, so must not be stopped until a pregnancy test is taken. Some people may experience spotting or some bleeding while waiting for their pregnancy test. If this occurs, it is important to continue with the pessaries and contact the nurses. Do NOT stop taking your progesterone support.

After the embryo transfer you may resume your normal daily activities. It is a good idea to avoid strenuous exercise and heavy lifting. It is also advisable to refrain from spa pools or baths due to the small risk of infection. There is a lot of advice on the internet regarding what to do following your transfer however please be mindful that information from the internet may not always be from a reliable source and often there is no sound evidence to support the advice. People often report that this is the most difficult time in the treatment cycle because there is really nothing to do except wait and hope. If you have any difficulties coping during this time, do not hesitate to contact our Counsellor or any of the staff.

Pregnancy test

The outcome of this IVF cycle is confirmed by a blood test approximately 16 days after your egg collection. If your first pregnancy test is positive, you will be asked to repeat the test two or three times before having an ultrasound scan to confirm a uterine pregnancy. The pregnancy hormone (hCG) level needs to rise appropriately; the nurses will discuss this with you following each test.

If the pregnancy test is negative the nurses will discuss your next step with you. Your cycle will be reviewed by the medical and scientific directors and you will receive a review letter following this. You can then request a face to face review appointment with one of our consultants if you wish to have one. However, if you would like a review appointment earlier than this please ring and speak to one of the nurses.

After a negative pregnancy test you may need a few days to reflect on your future options. Please call the nurses at any time to make a review appointment if you wish to have one.

Will I be eligible for a second public cycle?

Publicly funded patients whose first cycle does not result in a live birth may be eligible for a second publicly funded cycle, if they still meet the criteria (under 40 years old, BMI less than

32, non smoker) i.e. If the woman has turned 40 before she completes her first cycle, she will not be eligible for a second publicly funded cycle. Unfortunately there is a variable wait time for the second cycle. A cycle is not complete until all frozen embryos have been thawed and transferred. These thaw cycles are publicly funded as long as there are not two children to the relationship. Fertility Plus offers private cycles if a couple wishes to have another cycle whilst waiting for their second publicly funded cycle.

Pre-treatment Advice

Many couples undergoing fertility treatment are concerned that they might need to dramatically change their lifestyle before and during treatment. For most healthy men and women, the changes will be minimal. However, there are some important modifications that you may wish to make to maximise your chances of conception. Research has suggested that the factors listed below may have an effect on conception and the outcome of treatment.

Body weight

Women who are overweight or underweight are less likely to conceive following most forms of infertility treatment, particularly IVF. This is reflected in the Ministry of Health's eligibility criteria for accessing publicly funded fertility treatment, which is only available to women with a body mass index (BMI) of 32 or less.

Being overweight during pregnancy also increases your chances of having a baby with a congenital abnormality, developing diabetes or pre-eclampsia, and requiring delivery by caesarean section.

The most effective lifestyle change you can make to improve your chances of conception and having a healthy baby is maintaining a healthy body weight. A BMI of 20 to 25 is ideal.

There is also increasing evidence that male obesity is associated with reduced sperm concentration and motility.

Smoking and Alcohol

Smoking and alcohol are discouraged for both men and women. There is evidence to suggest that smoking and alcohol reduce sperm quality and numbers, and embryo implantation can also be affected. Smoking in pregnancy can increase the risk of ectopic pregnancy, haemorrhage, low birth weight babies and premature labour.

Smokers are not eligible for public funding; a woman needs to have stopped for three months before becoming eligible. It is strongly recommended that private patients who smoke should consider giving this up. If you stop smoking you can improve your chances of conception and having a healthy child. We can refer you to a smoke cessation programme if you need some support in doing this.

The use of marijuana and other recreational drugs should also be avoided if you are planning to become pregnant. Marijuana has a detrimental effect on sperm quality.

There is little evidence that occasional or moderate alcohol consumption reduces either male or female fertility, but higher levels of alcohol consumption can have detrimental effects. We encourage women not to drink alcohol if they are trying to conceive. Any alcohol consumption is harmful in pregnancy

Caffeine Intake

It is recommended that any women experiencing fertility problems should limit their intake of caffeine to 100-130mg daily. An approximate amount of caffeine in one cup of coffee is about 100mg. Tea, chocolate and some medications also contain caffeine. Decaffeinated

coffee should also be restricted, as the chemicals used in the process are also potentially harmful. Substances containing tannin e.g. tea and red wine, should also be limited.

Stress

Patients cope with the stress of their infertility and treatment differently. To help you with the stress of fertility treatment, some people find it helpful to use relaxation techniques such as meditation, yoga and listening to relaxation tapes. The counsellors are available before, during and after your treatment if you wish to talk to someone for extra support.

Fertility Plus is currently participating in a multicentre trial to assess the effectiveness of acupuncture on pregnancy rates in IVF. For more information regarding this trial please speak to the Fertility Plus nurses.

Health and medication

Some medications can affect the reproductive system of men and women e.g. medication for epilepsy, hay fever, gout, gastric and blood pressure disorders, steroids and antibiotics. Please discuss it with your doctor if you have any concerns regarding the medication you are taking, this includes vitamins and herbal supplements.

Male partner's role

General precautions to take are avoiding hot baths and spas, wearing loose underwear and to avoid working with a laptop on your thighs. Current research also indicates that sperm health is improved by frequent ejaculation (every 48-72 hours). Long periods without ejaculation (abstinence) may have a negative effect on the genetic make-up of sperm and thus result in poor embryo quality after fertilisation. There is some limited evidence that it may be helpful for the man to take a supplement of antioxidants e.g. Menevit.

The male partner is recommended to abstain from ejaculation or sexual intercourse for **2-3** days prior to treatment.

Some partners often feel there is not much they can do to help during the cycle. Feedback from couples that have been through IVF suggest that practical and emotional support is incredibly valuable during this time.

Folic acid and Iodine intake

Research over the last 20 years has suggested a relationship between maternal diet and the occurrence of neural tube defects in babies. Neural tube defects (spina bifida, anencephaly and encephalocele) result from defective closing of the neural tube in early pregnancy. The neural tube is the embryological structure from which the brain and spinal cord develops. It closes around the 27th day post-fertilisation. Most infants with neural tube defects are either stillborn or die early in life. The remainder usually have lifelong physical and sometimes intellectual disabilities. Recent studies on the effect of vitamin supplements in women planning a pregnancy have found that folic acid can considerably reduce, though not entirely eliminate, the chance of neural tube defects.

Folic acid is a water-soluble vitamin found in many fruits (particularly oranges, berries and bananas), leafy green vegetables, cereals and legumes. It can also be taken in tablet form. The tablets are available from chemists, supermarkets and health food stores. The recommended dose is 0.8 milligrams per day. You should being taking folic acid two months before the possibility of becoming pregnant i.e. one months prior to treatment, through to 12 weeks after actually becoming pregnant. If there is a possibility of pregnancy occurring naturally you should begin taking folic acid.

Iodine supplements are recommended from the confirmation of pregnancy onwards. Iodine is essential for healthy brain development and foetal growth. Many New Zealanders have a diet mildly deficient in iodine. The recommended dose is 150 micrograms (0.150 milligrams)

per day. Iodine supplements should be continued right through your pregnancy.

Both folic acid and iodine supplements are available over the counter at any chemist. We can also provide you with a prescription.

Sperm DNA damage

Some degree of DNA fragmentation in a semen sample is normal. This DNA damage is primarily caused by 'Reactive Oxygen Species' or ROS which are a natural by-product of cell function. However levels of ROS can increase during times of environmental stress or inflammation and can lead to high levels of DNA damage. A high level of DNA fragmentation can be associated with a number of factors such as poor diet, smoking, and exposure to environmental toxins, infections of the genital tract or defective packaging of DNA during sperm production. There may also be a genetic cause for high levels of DNA fragmentation.

Until the third day of development the quality of an embryo is predominantly determined by the egg quality. Sperm DNA contributes to embryo development after the third day.
Fertilisation of eggs by sperm which have fragmented DNA or abnormal chromosomes can result in poor blastocyst development. This in turn can lead to decreased implantation rates, lower pregnancy rates and increased risk of recurrent pregnancy loss.

Sperm Chromatin Structure Assay (SCSA) is a specialised test which is used to assess the degree of DNA fragmentation within the sperm head. Studies have shown that patients with more than 30% of sperm cells with DNA fragmentation are more likely to have reduced fertility. PICSI in conjunction with ICSI maybe recommended for those patients with increased sperm DNA fragmentation (see page 26)

SCSA testing is not performed routinely, your doctor with recommend it if necessary. This test is performed before treatment starts, results take approximately 3 weeks. SCSA is not covered by public funding.

Getting Started

Prior to commencing IVF/ICSI treatment, you will be required to attend an orientation session. At this session you will have the opportunity to meet and discuss your treatment with a consultant, nurse, embryologist and counsellor. At this time you will be informed of which month your IVF cycle will commence.

Treatment consent forms

Consent forms for your treatment are included in your information pack and will be discussed at your orientation.

The consent forms that you will be required to sign are:
1) Consent to egg collection – to be signed by the female partner only. This will be signed on the day of your egg collection.
2) Consent to procedures involved in IVF treatment– to be signed by both partners.
3) Consent form to procedures involved in ICSI (if applicable) – to be signed by both partners.

These forms are to be completed and signed in the presence of one of the Fertility Plus clinical staff members.

If the status of your relationship changes, you may wish to alter your consent forms both for IVF treatment cycles and for further frozen embryo replacement cycles. We strongly recommend you advise us should this occur.

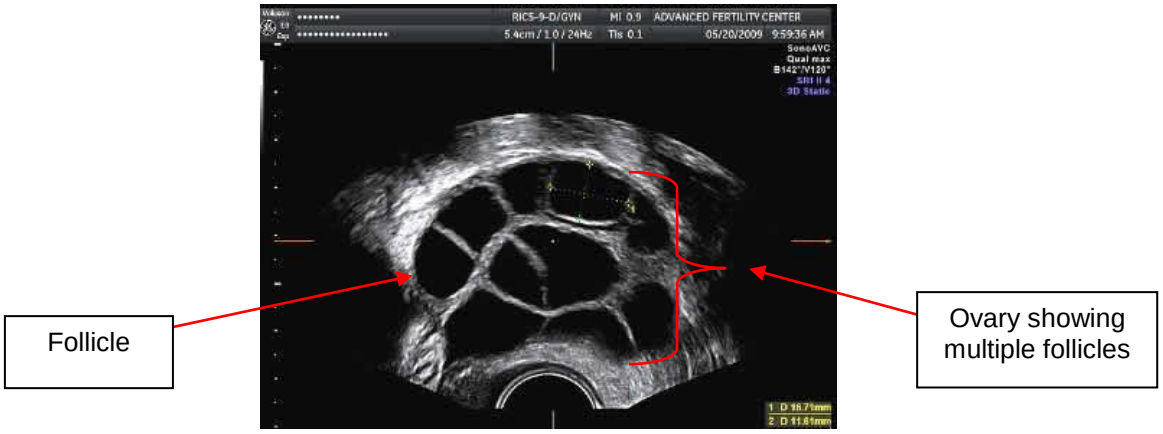
Receiving your treatment diary, drugs and syringes

Once you have called us on the day one of your menstrual cycle as you will be instructed, you will receive a treatment pack containing your diary, with dates to start your drugs etc. This pack will contain all the information you require including blood test forms. All blood tests are done at Lab Tests. If you reside in Auckland you will collect your drugs when you come in for your injection teach, if you live outside of Auckland we can courier your drugs to you.

Ultrasound Scans

The scans are performed at Fertility Plus. Ultrasounds scans are used to determine the response of the ovaries to the stimulation drugs that you will be having. Ultrasound scans are also performed to measure the thickness of the endometrium and help to assess the location of the ovaries for the egg collection. All scans are vaginal (internal) and require an empty bladder. The only time a full bladder will be required is for your embryo transfer.

Image of an ultrasound scan monitoring the developing follicles on a stimulated ovary



Drugs Used In Fertility Treatment

All of the drugs that you will be required to administer are given by subcutaneous injection. (refer to ‘a guide to subcutaneous injection’). This is an injection which is given just under the surface of the skin, and can easily be self-administered.

GnRH Agonist (Buserelin)

Buserelin is a GnRH agonist which works by suppressing the release of FSH and LH from the pituitary gland, thus causing 'down regulation' of these hormones in preparation for treatment. However, in the first two days after Buserelin administration, there is a temporary rise of the LH and FSH levels, before they then begin to decrease. You will continue to administer this injection up until the day of your trigger injection.

The standard dose of Buserelin is 0.2mg (20 units) per day, unless otherwise advised.

GnRH Antagonist (Cetrotide or Orgalutran)

The GnRH antagonist (Cetrotide or Orgalutran) works by directly blocking the effect of GnRH, which is the hormone that causes the release of LH and FSH. This prevents the premature LH surge in women undergoing controlled ovarian stimulation. In doing so, this allows eggs to reach the level of development needed for the eggs to be collected. As the antagonist only needs to be administered once follicles are at risk of an LH surge and it is

only needed for a short part of the cycle once stimulation has begun. Once you commence this injection you will continue to administer it up until the day of your trigger injection.

Follicle Stimulating Hormone - FSH

There are three brands of recombinant FSH currently available, **Puregon**, **Gonal-F and Menopur** which are used to stimulate the ovaries. Menopur is a urinary FSH that is available, it does not come in a preloaded pen but as a powder which needs to be reconstituted before use. The function of FSH is to stimulate the growth and maturation of multiple follicles. As follicles grow they produce increasing amounts of estradiol (the level of this hormone is measured with a blood test). Estradiol stimulates the growth of the endometrium. Very occasionally the ovaries may over respond to ovarian stimulation with FSH. Please refer to the section OHSS for more information regarding this.

Both Buserelin and FSH need to be given daily at approximately the same time every day including the weekends. Please do these injections in the afternoon or evening.

Important: These drugs are available in varying doses. Please ensure that you are administering the correct dose.

hCG trigger injection (Ovidrel)

You will use 250 mcg of Ovidrel subcutaneously.
The trigger injection initiates a final maturation of the eggs in preparation for egg collection in much the same manner that LH matures the egg for ovulation in a natural cycle.

In some cases a patient may require a different drug to be used for trigger; this will be discussed with you if required. This is an Agonist trigger of Buserelin used only in Antagonist cycles. It is given when there is a large number of follicles to reduce the risk of hyper-stimulation. After an agonist trigger, it is usual to freeze all the embryos. If there is a fresh transfer, extra luteal support is required. This will be prescribed and discussed with you if appropriate.

Progesterone (Utrogestan, Crinone or Gestone)

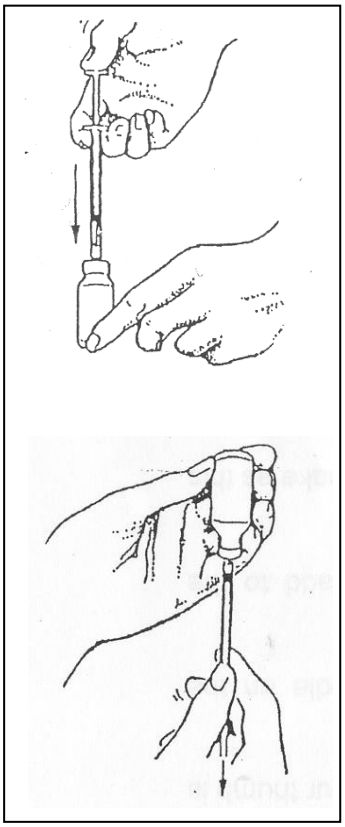
Utrogestan vaginal or rectal pessaries are used to support the endometrium following your embryo transfer. They will be given to you the day of your egg collection and should be commenced the following day. Two pessaries need to be inserted three times a day up until your pregnancy test. If your pregnancy blood test is positive you will continue the pessaries until week 9 of pregnancy.

Sometimes a progesterone gel (Crinone) may be substituted or given in addition to the pessaries. Very occasionally you may be advised to have an intramuscular injection of Gestone as an alternative progesterone support.

A Guide to Subcutaneous Injections

Please note that these instructions are a back-up only. **All instructions will be given at your injection teaching appointment.** It is important that you have adequate instruction from a nurse - either at Fertility Plus, or through a Practice Nurse, on how to prepare and administer your drugs.

Drawing up Buserelin



- Standard dose of Buserelin is 0.2mg (20 units) unless otherwise advised.
- Assemble all your supplies before preparing the medication.
- Wash and dry your hands.
- Remove syringe from its covering.
- Wipe the rubber cap of the Buserelin vial with an alcohol swab.
- Insert the needle carefully through the rubber cap, and turn the vial upside down, withdrawing the amount required.
- Ensure no large air bubbles are present.
- Check you have the right amount of Buserelin before injecting.

The Gonal F and Puregon Pen

Gonal-F and Puregon are administered via a pen device. You will be given full instructions for these injections when you come in for your injection teach as they are specific to each type of pen.

How to perform subcutaneous injections

Subcutaneous injections are given to the subcutaneous layer just beneath the skin.

The injections are given in the lower abdominal area (away from scars and the tummy button) or to the front of the thigh.

Change injections sites daily by switching from side to side.

To perform the injection:

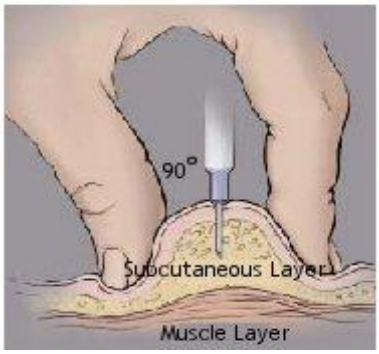
1) Pinch the skin

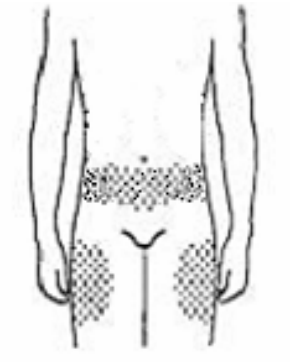
2) Insert the needle at a 90 degrees angle through the skin

3) Inject the drug and pause a few seconds

4) Withdraw the syringe and release the skin.

Report any skin problems associated with the injections to a Fertility Plus nurse, or your GP. Please do not hesitate to phone the clinic if you have any questions or queries.





Ovidrel Injection (trigger)

When you are ready for your trigger injection you will be given one box of Ovidrel 250 mcg. This drug comes in a prefilled syringe and all you need to do is remove the lid and inject as you have done with your other injections.

On the day of your trigger injection please take your agonist or antagonist drug in the usual manner and at the usual time, but do not take your FSH injection (Gonal F or Puregon).

There are no injections to take the day before your egg collection; your trigger is the last injection.

What Happens In The Fertility Laboratory?

The embryologists at Fertility Plus perform all of the embryology (the care of eggs & embryos) and andrology (sperm) procedures. Please feel free to ask them any questions that you may have in regards to your eggs, sperm or embryos.

Egg Collection

During the egg collection, the embryologist is present in theatre. The doctor collects fluid from each follicle in the ovary, which drains into a test tube. The embryologist then checks this fluid under the microscope for an egg. It is important to remember we may not retrieve an egg from every follicle. If an egg is found, the embryologist will transfer it into a test tube containing special nutritional liquid called culture medium. After the egg collection, the embryologist will transfer the eggs into a fresh dish of culture medium and place it in the incubator.

Semen Sample

On the day of egg collection, the laboratory will need a semen sample from the male partner.

Samples are usually produced in a private room at Fertility Plus but can also be produced at home and brought to the laboratory within one hour of ejaculation. **If you wish to bring the sample from home please let the laboratory know on 09 630 9842**.

The male partner is recommended to abstain from masturbation or sexual intercourse for 2-3 days prior to treatment. The sample is produced by masturbation, with care being taken not to contaminate it with any toxic agent such as soap, lubricants or condoms.

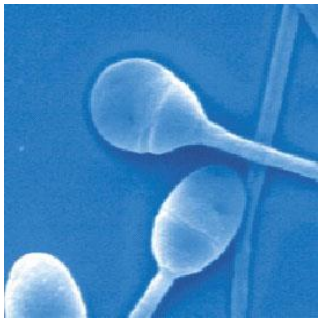
The semen sample must be brought to the laboratory by the man who produced it, and he must bring photo identification which will be checked by the laboratory staff.

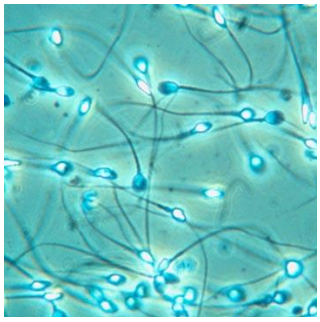
Please contact one of the embryologists if you have any concerns about producing a semen sample. We can freeze a sample as back-up if the male partner is concerned about not being able to produce a semen sample or is unable to be at the clinic on the day of egg collection. However, there is a charge for freezing and storage. Please note that this will not be covered by government funding unless this is requested with a medical referral.

Semen Preparation

Once we have received the semen sample, it is spun through a gradient of wash solutions. This is to harvest the good quality, fast moving sperm for treatment. The sperm is then added to the eggs 4-6 hours after egg collection.

Human Sperm





The sperm can be added to the eggs in two ways: In Vitro Fertilisation (IVF) or Intra-cytoplasmic Sperm Injection (ICSI).

In Vitro Fertilisation (IVF)

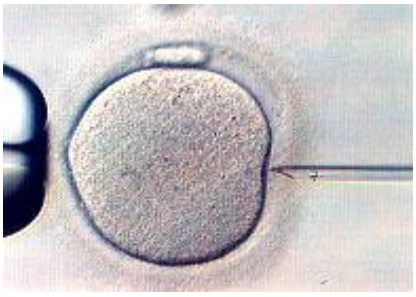
In cases where there is no indication of any semen abnormality or male factor infertility, approximately 200,000 motile sperm are added to the medium containing the eggs. This is called insemination. The dish is then returned to the incubator overnight and the sperm are left to make their way to the eggs and attempt to fertilise them. The day of egg collection and insemination (IVF/ICSI) is called **Day 0**.

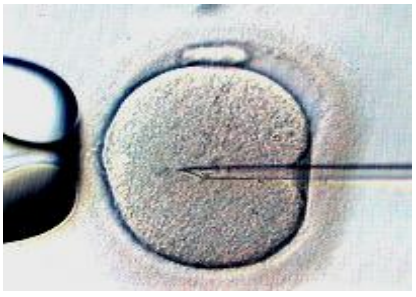
Intra-cytoplasmic Sperm Injection (ICSI)

In cases where there are very low numbers of motile sperm, a single sperm is injected into each mature egg using a technique known as ICSI. The cumulus cells which surround the egg are removed or denuded about 3-5 hours after egg collection. The embryologist can then determine the number of mature eggs. Only eggs that are mature will be suitable for injection, it is not uncommon to retrieve immature eggs from smaller follicles.

A Mature Human Oocyte (Egg)

If the male partner does not have any sperm in the ejaculate, the sperm may be surgically retrieved from the testis (TESA or TESE). When a patient has a small part of the testis removed or biopsied, it may take the embryologist several hours to find sperm. Very occasionally, there may not be enough sperm to inject all the mature eggs.





The egg is held steady by gentle suction and the sperm is positioned near the tip of the needle before being injected into the egg.

Physiological Intra-cytoplasmic Sperm Injection (PICSI)

PICSI is a sperm selection procedure used in some cases of ICSI. This method allows for selection of mature sperm that bind to the protein called hyaluronan, a major component of cumulus (cells surrounding the egg) and zona pellucida (outside layer of the egg). Sperm are

placed in a PICSI dish containing hyaluronan and the sperm bind to hyaluronan in a similar way to the natural process of mature sperm binding to the egg. These sperm are used for the ICSI procedure. Hyaluronan-bound PICSI-selected sperm are typically mature and functionally competent and exhibit on average less DNA fragmentation and fewer frequencies of aneuploidy (an abnormal number of chromosomes). PICSI may aid patients who have increased levels of sperm DNA fragmentation (see page 19)

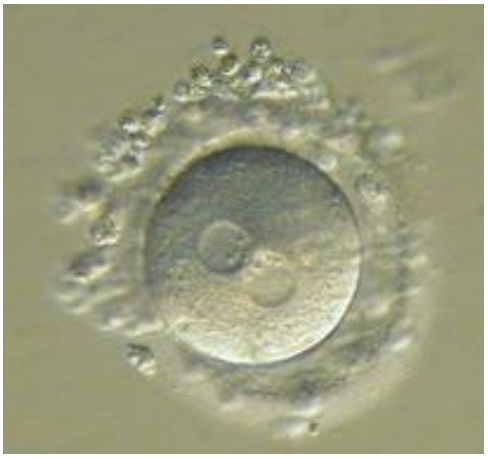
Sperm DNA and chromosomal integrity is important for normal embryo development. Sperm DNA contributes to embryo development after Day 3 and can therefore affect embryo quality and developmental progression from day 3 to day 5. Fertilisation by sperm containing fragmented DNA or abnormal chromosomes can result in poor embryo development, decreased implantation, lower pregnancy rates and recurrent pregnancy losses.

Your doctor will recommend PICSI if it is suitable. PICSI is not covered by public funding.

Fertilisation Check

The embryologists will check to see if the egg has fertilised on the morning of **Day 1**. A fertilised egg becomes known as an embryo.

For IVF cases, the cumulus cells surrounding the eggs are removed about 18 hours after insemination. This is achieved by gently sucking the egg up and down in a fine plastic pipette. The embryologist will then be able to check for two pronuclei (2PN), which appear as two circles at the centre of an embryo. One PN contains the genetic material (chromosomes) from the sperm and the other PN contains chromosomes from the egg. All eggs with 2PN are normally fertilised embryos.



A normally fertilised (2PN) Embryo

Occasionally in IVF an embryo can have more than 2PN. These embryos are considered to be abnormal because more than one sperm would have fertilized the egg. Thus the embryo will have more chromosomes than it should. These embryos are discarded.

For ICSI cases, the eggs are already free of cumulus cells on day 1 and the embryologist can check for fertilisation at 18 hours post sperm injection.

Once embryos are assessed for fertilisation they are transferred into fresh culture medium and returned to the incubator.

The fertilisation rate varies from patient to patient. On very rare occasions there may be no fertilisation and therefore no embryos to transfer. An embryologist will phone you the morning after egg collection to inform you how many eggs have fertilised.

Early Embryo Cleavage

Twenty four hours after insemination the embryos are assessed. This is to record if any of

the embryos have already begun dividing (early cleavage). Very occasionally, some eggs which were previously thought to be unfertilised may now have 2PN present, this is known as delayed fertilisation.

Embryos are assessed once a day on day 2, 3, 5 and 6. They are not assessed on day 4. You will receive a phone call from your embryologist at fertilisation check, on day 3, and again on day 6 to inform you about the fate of any remaining embryos.

Embryo Transfer

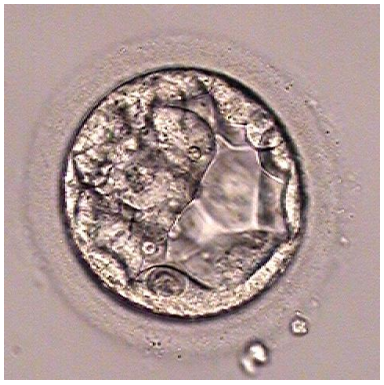
Embryo transfer can take place on either day 2, 3 or 5. The embryologists will grade your embryos based on morphological features such as cell number, size, shape, and degree of fragmentation. The best quality embryo is replaced and any remaining viable embryos are grown until day 6 and can be frozen on day 5 or 6 if they are suitable (see Embryo Freezing).
Following fertilisation check most patients will be given a potential embryo replacement time for day 3 (unless otherwise advised).

The embryologist will assess embryo quality early in the morning of day 3 and will phone you to either to confirm your appointment or recommend postponing the replacement until day 5. If it is clear which embryo is the best quality embryo (based on our assessment criteria), then the embryo should be replaced on day 3. However, if there are at least 3 embryos at the right stage and quality on day 3 **and** it is a difficult choice between them the embryologist will recommend continuing to culture the embryos in the laboratory until day 5. This is called blastocyst culture.

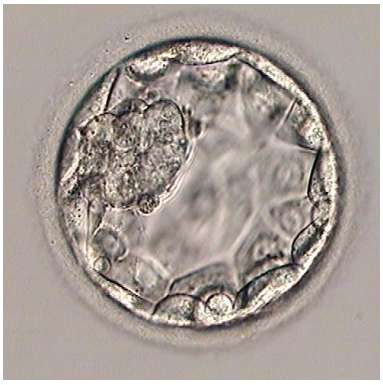
An embryo must develop into a blastocyst by day 5 or 6 to be able to implant in the endometrium. The individually cleaving cells of the day 3 embryo must stick together (compact) and reorganise into two different cell types- the trophectoderm cells which if the embryo implants could give rise to a placenta, and the inner cell mass which could give rise to a fetus.

Not all day 3 embryos will continue developing into a blastocyst. By culturing the embryos on it enables us to see which ones continue developing, therefore we can select the best quality embryo for replacement. Approximately 40% of fertilised eggs go on to develop into a blastocyst in culture.

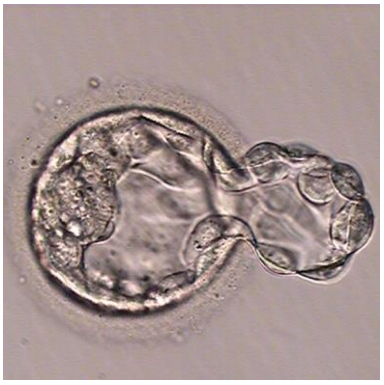
Although we would expect to get at least one blastocyst using our criteria, there is a small risk that there may not be any embryos that have developed into blastocyst by day 5. It is important to realise that extended culture does not improve the quality of the individual embryos therefore if we are able to select the embryo with the most potential on day 3 we will recommend replacement on this day. This will be discussed with you following your fertilisation check.



Day 5: Early Blastocyst



Day 5: Expanded Blastocyst



Day 6: Hatching Blastocyst

Embryo Freezing

At Fertility Plus, approximately 40-45% of couples having IVF will have embryos suitable for freezing following their IVF cycle. If there are any extra embryos remaining in culture they will be cultured until day 5 and 6 and if they develop into a blastocyst of suitable quality they can be frozen. If patients have embryos which are not viable or do not wish to have embryos frozen, they can choose to have these embryos returned to them, or request that they are disposed of by the laboratory.

The basic freezing process involves passing the embryo through a series of solutions which replaces some of the water in the embryo with a cryoprotectant solution. This acts like antifreeze to help prevent ice crystals forming during the freezing process which can damage the embryo. The embryos are then placed in plastic straws, sealed with labelled rods and placed in the freezing machine. Slightly different protocols are used for early/day 3 embryos and blastocyst stage embryos. In general, the embryos are slowly cooled to either -30°C or -32°C, respectively. The straws containing the embryo(s) are then loaded into a clearly labelled plastic container and stored in a liquid nitrogen tank at -196°C. The liquid nitrogen ensures that all biological activity in the embryo is stopped and therefore any development is suspended until they are thawed. In theory embryos could remain in this state indefinitely although by law we can only store them for a maximum of 10 years.

If you have embryos frozen following your publicly funded IVF cycle, public funding only covers embryo storage for the first 18 months. If you have frozen embryos remaining after this time, you will be invoiced annually each July for storage.

"Freeze All" Cycles

If the doctor has recommended a "freeze all" cycle your embryologist will advise you of the number and stages of embryos that have been frozen.

When there is a fresh transfer all embryos are grown to Day 5 or 6 before freezing to allow them to become blastocysts.

However, if one is having a freeze-all cycle and only up to 5 eggs are recovered, it is usual for the embryologist to freeze all the fertilised eggs on Day 1. If 6 or more fertilised eggs are obtained, we would advise culturing to day 5. However, if previous cycles have not yielded blastocysts, some may be frozen at day 1. This will be discussed with you.

When you come for your thaw cycle a single blastocyst will be thawed. If you have 2pn (day 1) embryos frozen, they will all be thawed and cultured until the "best" embryo can be chosen. If another embryo develops to the blastocyst stage, this can be refrozen.

Embryo Thawing

Approximately 80% of embryos (90% of blastocysts) that are frozen survive the process of freezing and thawing. The thawing process involves removing the embryo straw from the liquid nitrogen and bringing it back up to room temperature. The embryo is then removed from the straw and passed through a series of solutions, which essentially re-hydrates the embryo. The embryo is then placed in culture medium until the time of transfer.
Our SET policy (see pages 15/16) applies to thawed embryos as well as fresh. Most patients will have a single blastocyst thawed and transferred. However, some patients have several embryos frozen at the early pronuclear stage. We advise thawing all of these embryos and culturing them until Day 3 or Day 5 for SET. Any extra embryos which reach the blastocyst stage can be refrozen.

Patients must fill in a consent form consenting to thawing an embryo(s). This form must be signed by the woman and man who created the embryos. **The embryologist will not be**

able to thaw the embryo(s) until the lab receives the consent form. It is Fertility PLUS policy to replace only one thawed blastocyst, unless a woman has had many previous unsuccessful transfers.
The laboratory must receive this consent form before the day the embryo is to be thawed. If we have not received your consent form, the embryologist **will not be permitted** to thaw your embryos.

It is often not necessary to take any fertility drugs in a frozen embryo replacement cycle. Your menstrual cycle is tracked with blood tests in order to detect when you are ovulating. The date of ovulation will allow us to determine the appropriate day for your embryo to be thawed. Occasionally, an embryo may not survive the freezing and thawing process. In this case, if there is another embryo in storage this will be thawed. The lab staff will inform you before the time scheduled for transfer if the embryo does not survive.

Infection in culture dishes

The media we use to culture eggs, sperm and embryos contain antibiotics, but very occasionally the medium containing the embryos may become contaminated and cause the embryos to die. At Fertility Plus this has only happened in approximately one in a thousand cases. Most semen samples do contain some bacteria, often from the skin. Very rarely the bacteria can be resistant to the antibiotics and therefore may continue to grow in the media. Yeast and bacterial infections could also be picked up at egg collection and be transferred to the culture dishes.

Quality Assurance

To eliminate the risk of misidentification of eggs, sperm and embryos, the laboratory has a cross-checking/double signing policy and system in place. All eggs/sperm and embryos are placed in dishes which are clearly labelled with the female partner's name and a unique identification code. During all procedures where eggs, sperm or embryos are moved, the name and the code are cross-checked and double signed by two embryologists.

Pre-implantation Genetic Diagnosis (PGD)

This is a technique which is available at Fertility Plus for patients whom have a **known genetic disorder** and are at risk of passing on this disease to their children. It cannot be used for sex selection.

PGD is a diagnostic test carried out on a few cells from the embryo before transfer. PGD allows couples at risk of passing on a genetic disease to have a child that does not carry the genes for the disease and that is fully genetically related to them. It is a diagnostic test generally performed on day 5 and 6 embryos (blastocyst) to detect known genetic diseases or chromosomal abnormalities.

Testing a foetus through amniocentesis or chorionic villus sampling were the only methods of diagnosing genetic diseases prior to PGD. However, with these techniques the couples have the dilemma of whether or not to terminate the pregnancy if the genetic abnormality is present. With PGD, we can diagnose the condition in embryos before the embryo(s) are replaced and transfer only the unaffected embryo(s) before pregnancy is established.

PGD is most useful for patients who are at risk of passing on single gene defects like Cystic Fibrosis, Thalassemia, Tay Sachs, Spinal Muscular Atrophy, Myotonic Dystrophy or Huntington's disease. It is also useful for detecting chromosomal abnormalities (aneuploidy) that may result in diseases such as Down syndrome, Klinefelter syndrome (47 XXY) or Turner syndrome (45 X).

It is necessary to undergo IVF with ICSI in order to perform PGD. On day 3 a small hole is made in the shell (zona pellucida) using a laser. By day 5 or 6 (blastocyst) a small portion of the embryo should hatch out of the shell, where the hole was made on day 3. The embryos are then 'biopsied' removing the hatched cells. All biopsied embryos are then frozen. Please note that there is no guarantee that embryos will make the blastocyst stage.

The cells from each embryo are then analysed to look for abnormalities by either PCR (Polymerase Chain Reaction) or array CGH. PCR is mainly used for detecting single gene defects. Multiple copies of the piece of DNA coding for the gene in question are made using PCR. They are then analysed for the presence of mutations. Array CGH is used to detect sex-linked disorders and chromosomal abnormalities. Array CGH fluorescently labels multiples of DNA from the embryo biopsy. The fluorescent intensity of the embryo biopsy sample is then compared to control groups.

Embryo biopsy cells are sent to Australia for analysis. Results take approximately two weeks, we will contact you as soon as we receive them. Unaffected embryos can then be thawed and transferred on a frozen embryo transfer cycle.

There is an information sheet available for couples considering PGD and we suggest you talk to the doctor if you have any questions.

Uncertainties Associated With IVF

There are many uncertainties for couples when coming through an IVF cycle. These issues are briefly outlined below.

Sometimes an IVF cycle is stopped before egg collection. Reasons for this include:

- Risk of OHSS (as above)
- Development of fewer than 3 follicles after FSH (i.e. “poor response”)
- Physical factors detected by consultant at scans
- Patient choice

- On the day of egg collection, there may be anxieties about how many eggs will be retrieved and how many will be mature. While there is usually an egg in every follicle, there can be difficulties in getting them out and we may not retrieve an egg from every follicle. We usually retrieve eggs from approximately 80% of follicles. If an egg is not retrieved after the follicle has been drained, some culture media will be introduced into the follicle in an attempt to flush the egg out. Very rarely have there been situations where no eggs are retrieved. It is not uncommon to retrieve immature eggs from the smaller follicles.

- A small number of women over stimulate in response to the FSH, producing more than fifteen eggs. If the doctor is concerned that you are at risk of ovarian hyper stimulation syndrome (OHSS), then a decision may be made not to carry out a fresh embryo transfer but to freeze all embryos. This avoids the possibility of OHSS being exacerbated by the hCG hormone, should a pregnancy occur. A frozen embryo transfer can be performed in a later cycle once the ovaries have returned to normal. For further information see ‘OHSS’.

- If there is no indication that the cause of infertility is male factor, then approximately 70% of the eggs will be expected to fertilise on the day following egg collection. Sometimes less than 70% of eggs may fertilise. This can occur particularly in cases of severe male factor infertility, after ICSI. Normal fertilisation is indicated by the presence of two pronuclei. Approximately 7% of eggs are found to fertilise abnormally with 3 pronuclei present. This can be due to either the egg not being at the correct stage of maturity when it is exposed to sperm, or, where more than one sperm enters the egg. As it is known that these eggs can result in an abnormal fetus and miscarriage, they are routinely discarded and not replaced or frozen. Very rarely do none of the eggs fertilise.

- Not all eggs that fertilise will continue to grow and divide into a normal embryo. It is important that couples are aware that it is normal to have a variation of embryo stages (cell number) and grades in your group of embryos at any point during culture. We do not expect every embryo to be capable of going on to form a blastocyst which can achieve a pregnancy. The embryologist will be able to give you some indication of how your embryos are developing and which one(s) we are replacing and why. Approximately 40% of fertilised eggs go onto develop into blastocysts in culture.

- There is no evidence that intercourse during your treatment cycle or early pregnancy is harmful. However, this issue can cause anxiety, so please feel free to discuss this with the staff. We are stimulating the ovaries to produce multiple eggs and not all the eggs may be collected. If your fallopian tubes are open we advise you to use condoms following your trigger injection to avoid the possibility of uncollected eggs fertilising naturally.

Risks Associated With Treatment

It is important to remember that any medical or surgical treatment has risks, adverse effects and side effects.

Anyone taking medication for any reason should be aware of the possible side effects and should report adverse effects to those managing their treatment. The drugs used for IVF are known to create some minor side effects, but there is no evidence of increased risk to a baby born.

The aim of this section is to briefly review some of these risks. The Fertility Plus staff will be happy to discuss any of these issues with you at any time.

Drug Administration

GnRH agonist (Buserelin)

The action is to cause an initial surge and eventual suppression of FSH and LH from the pituitary gland in the brain. When the ovary does not receive messages from the pituitary hormones it enters the same state as the ovary of a menopausal woman. Like menopausal women, you may experience hot flushes, headaches and skin dryness. This is temporary and these side effects will stop once the normal hormone balance is restored at the completion of treatment.

FSH (Puregon, Gonal F or Menopur)

These drugs are used to encourage development of multiple follicles in the ovaries. As the ovaries are swollen with follicles, some tenderness and swelling of the abdomen may be experienced. The increase in estradiol as a result of multiple follicle growth can cause breast tenderness. Some women also experience slight nausea and dizziness.

Occasionally, too many follicles develop and a condition called Ovarian Hyper stimulation Syndrome (OHSS) may occur. Please refer to the section on OHSS.

Some women report a localised reaction at the site of the injection. Any localised redness or swelling can be treated effectively with a cold compress or Calamine lotion. If this reaction persists, or the redness and swelling do not subside, please contact Fertility Plus and speak to a nurse.

Egg collection

The egg collection is carried out by removing the fluid from the follicles in the ovaries and searching for the eggs in the follicular fluid. Usually this is performed under light sedation using a vaginal ultrasound probe, and a needle which runs up through the top of the vagina and into the ovary.

It is common to have mild abdominal pain and some spotting after your egg collection. Very rarely more serious complications can occur such as damage to structures surrounding the ovaries such as blood vessels and the bowels. Very rarely significant bleeding can occur which may require hospitilisation. Very rarely cases of pelvic infection following an egg collection have been reported. Your doctor may request antibiotics to be given via intravenous drip at the time of the egg collection if required.

If acute abdominal pain or a high temperature occurs following your egg collection please ring the Fertility Plus Unit, or, outside clinic hours, the Women's Assessment Unit (WAU) at Auckland City Hospital on 09 631 0784.

Your doctor will go through the risks with you prior to your egg collection.

Multiple pregnancy

One of the concerns with IVF or ICSI treatment is multiple pregnancies, and there is a move worldwide to limit the number of embryos replaced to one.

The main risks associated with a multiple pregnancy are an increased risk of preterm birth, cerebral palsy and perinatal death. There is also an increased financial risk to a multiple pregnancy. Stillbirth and death within the first weeks of life are four times more common in twins and seven times more common in triplets than singleton babies. The incidence of cerebral palsy is five times higher for twins and eighteen times higher for triplets. Such infants are also more likely to be born prematurely and with a lower birth-weight and their mothers have a higher risk of dangerous complications such as pre eclampsia. Multiple pregnancies can cause a high level of stress for a couple.

Fertility Plus has a single embryo transfer policy. This means that we will replace one embryo per transfer in women regardless of their age. Double embryo transfer will only be considered for women who have had four previous failed single embryo transfers. Patients who wish to have a double embryo transfer (DET) on their 5th replacement are required to have an appointment with one of the fertility doctors to discuss this. Single embryo transfer remains to be strongly encouraged.

Our single embryo transfer (SET) policy has decreased our twinning rate significantly. In 2015, 98% of all transfers performed were with a single embryo. It is important to note that twins can still arise from single embryo transfer (monozygotic twins). For more information on the SET policy please see the section on embryo transfer.

Ectopic pregnancy

The incidence of an ectopic pregnancy does appear to be higher following IVF than one would expect following natural conception (0.5 – 1% births)

Current research suggests the risk of ectopic pregnancy following IVF and embryo transfer is around 2.2%. The risk of ectopic pregnancy is also affected by reproductive health of the women carrying the pregnancy and factors like tubal infertility and endometriosis can slightly increase this risk.

Miscarriage

The chance of miscarriage in the first eight weeks in an IVF/ICSI pregnancy is about 15-20% but after the first three months, the risk of miscarriage is very low.

Fetal abnormality following IVF/ICSI

The incidence of birth defects in naturally conceived children in New Zealand is approximately 6%. The recorded birth defects in children born after IVF at Fertility Plus since 2007 are 5.8% and for ICSI is 5.6%. There does not therefore appear to be any increase in abnormalities following these treatments at Fertility Plus, but we continue to monitor all birth outcomes.

A small percentage of men with oligospermia or azoospermia (low sperm concentration or no sperm) will have parts of their male (Y) chromosome missing. The Y chromosome is a

sex determining chromosome only present in the male karyotype and is passed from father to son. When ICSI is used to achieve fertilisation in someone with a Y-chromosome deletion this will be passed on to any son born as a result of treatment. Therefore, a boy born after fertilisation in this case will inherit oligospermia from his father.

It appears that 5-10% of azoospermic men have congenital absence of the vas deferens (CBAVD), a condition associated with certain cases of cystic fibrosis (CF). Two thirds of men with this condition appear to be carriers of the CF mutation. CF testing and genetic counselling may therefore be indicated for azoospermic men with CBAVD.

In the general population there is a small group of disorders known as 'imprinting disorders', examples of the more well known imprinting disorders are Beckwith-Wiedemann syndrome (BWS), Transient Neonatal Diabetes (TND), Angelman syndrome (AS) and Prader-Willi syndrome (PWS). There are some genes whose action/expression depends upon parental origin, for example despite two different copies of a gene being inherited- one from the mother and one from the father, only the paternal copy of the gene will be expressed, and vice versa, this is called 'imprinting'. In a very small number of people the normal imprinting process can be affected, thus causing an imprinting disorder. The incidence of these disorders is very rare in the natural population and is still very rare in IVF/ICSI babies. However, Beckwith-Wiedemann Syndrome (BWS) has been shown to be slightly more common in babies born from IVF/ICSI (occurring in 1 in 3,000-5,000 births) than in babies conceived naturally (around 1 in 20,000). For further information on these disorders, please contact the staff at Fertility Plus. Based on current evidence, the risk of imprinting disorders following IVF is extremely small and does not warrant routine screening. Fertility Plus has never had a baby born with an imprinting disorder.

Ovarian Hyperstimulation Syndrome (OHSS)

OHSS can be a complication of ovarian stimulation after fertility treatment with either Clomiphene tablets or FSH injections e.g. Puregon or Gonal-F. It is called a syndrome because there are many different signs and symptoms, but not all of them are necessarily present.

Many women who undergo an IVF cycle may develop some mild signs. Severe OHSS is much less common, but in some cases may be life threatening. In the case of severe OHSS hospitalisation and careful monitoring will be necessary. Fluid shifts from the blood circulation to other areas such as the abdomen and lungs. The cause is unknown but it occurs when ovaries are stimulated and then exposed to the hormones LH or hCG (human chorionic gonadotrophin). OHSS typically does not occur if there is exposure to LH alone. Exposure to the hCG hormone is through:

a) hCG trigger injection
b) pregnancy

Risk factors for OHSS

- Polycystic ovarian syndrome
- Previous OHSS
- Estradiol (E_2) level greater than 15 000 pmol/litre on day of trigger
- Greater than 15 follicles on scan before egg collection
- Large number of small follicles at the time of egg collection
- Under 30 years or age
- Low BMI

What can be done if the doctor suspects OHSS during my cycle?

- If the risk is detected early in the cycle, the doctor may suggest stopping the cycle and starting the next cycle with lower doses of ovarian stimulating drugs or a different stimulation protocol.

- An alternative, depending on how the follicles are growing, is ‘coasting’, where the FSH injection is omitted until the estradiol has fallen to a safer level to allow the trigger injection to be given.

- For patients who are on an antagonist cycle, an agonist trigger (Buserelin) can be administered instead of hCG.

- If the doctor is concerned at the time of the egg collection, it may be recommended that all of the fertilised eggs are frozen and no fresh embryo transfer occurs in that cycle. This avoids the possibility of OHSS being exacerbated by the hCG hormone, should a pregnancy occur.

What should I look for?

Your doctor may be able to predict at egg collection if you are at risk from OHSS and will advise you at that point. The risk is based on how many follicles have developed and your E_2 hormone level. The most common time to develop OHSS is in the week after the egg collection. Should you become pregnant, the syndrome could be made temporarily worsened due to the hormone (hCG) produced naturally in pregnancy.

Please discuss with the nurse/doctor if you experience:

Mild
An uncomfortable or bloated abdomen
Nausea and or vomiting
Diarrhoea

Moderate
All of the above symptoms plus:
Flu like symptoms - shortness of breath
Reduced urine output
Gradual weight increase of 1 kg per day
Tissue swelling in the upper thighs, pubes, and lower abdomen

Severe
All of the above symptoms plus:
Difficulty breathing
Dehydration
Pain around the ribs

Should you develop any of these problems, it is important to ring the clinic as soon as possible. **Outside the clinic hours, contact the Women's Assessment Unit at Auckland City Hospital on (09) 09 631 0784**. Blood tests and an abdominal scan may be carried out to check for excess fluid and the size of the ovaries.

Mild OHSS usually disappears quickly - it rarely takes more than a week or two to resolve, particularly if you are not pregnant. Should you develop moderate or severe OHSS then you may need a hospital stay where we can correct any dehydration, watch kidney function and possibly drain some of the fluid from the abdominal cavity.

It is important you understand this information and keep in contact with Fertility Plus should you have any areas of concern or feel you are developing OHSS.

Fertility Plus Clinical Pregnancy Results

January 2015 – November 2015

The statistics presented below represent pregnancy rates for women of all ages having an IVF or ICSI cycle in. Pregnancy rates differ according to age of the women and cause of infertility. All fertility clinics throughout Australia and New Zealand must report annual pregnancy outcomes for IVF/ICSI to the Perinatal Statistics Unit (NPSU). These statistics are collated and published each year so we are able to compare our results with other clinics.

IVF/ICSI January 2015 – November 2015

Number of egg collections (OPU)	470
Number of embryo replacements (ER)	339
Number of clinical pregnancies	106
Freeze all cycles	93 (20%)
Clinical pregnancy rate per ER	31%

Our 'Freeze All' policy, where all of the embryos are frozen without any being transferred relates to those patients who are at high risk of OHSS, has an elevated progesterone prior to egg pick up or has an agonist trigger on an antagonist cycle. In the last 2 years we have had a big increase in the percentage of freeze all cycles.

The above pregnancy rates include women of all ages having their own eggs collected (i.e excludes donor and surrogate cycles) and includes all causes of infertility and women over 40. Clinical pregnancy rate for women <39 years old having a single blastocyst transferred is 45%. Your consultant can request the clinics pregnancy rate for your particular circumstances.

Thawed Embryo Cycles January 2015 – November 2015

Clinical pregnancy rate per blastocyst thaw transfer 34% (111/329)

There have been no twin pregnancies this year on a thaw cycle.

With the move to fresh embryo transfer at the blastocyst stage, we now freeze embryos on Day 5, and not on Day 3. Many of the embryos we used to freeze on Day 3 were probably never going to become blastocysts, even if they had not been frozen. This means that we now freeze fewer embryos, but the pregnancy rate is higher when blastocysts are thawed and replaced. In 2015 the clinical pregnancy rate per transfer from thawed early embryos was 20% (22/109)

Donor Insemination Cycles January 2015 – November 2015

Number of insemination cycles	47
Number of clinical pregnancies	7
Clinical pregnancy per insemination	15%

Intrauterine Insemination Cycles January 2015 – November 2015

Number of insemination cycles	287
Number of clinical pregnancies	42
Clinical pregnancy per insemination	15%

For women <40years of age the clinical pregnancy rate/insemination was 17%.

Because all statistics are so dependent on the age of the woman, cause of infertility, number and stage of embryos being replaced, if you would like statistics that directly relate to your circumstances, please contact the Scientific Director, Margaret Merrilees on 630 9853

Cancer and Infertility

It has long been questioned whether treatment of infertility is associated with a risk of developing cancer.

There have been two studies suggesting an increased risk of ovarian cancer long term for women treated with lengthy courses of clomiphene. We usually advise that, for women who require clomiphene treatment, no more than 12 ovulatory cycles of clomiphene overall should be used.

Evidence suggests that there is no increased long term risk of cancer for women undergoing IVF treatment, even for women undergoing multiple IVF treatment cycles. This appears to be true for breast cancer and ovarian cancer, over which there were concerns as it was felt that they may occur more readily following the hormonal stimulation from IVF. This evidence is thus reassuring.

However, for women with a history of breast cancer, caution is advised when considering IVF treatment, especially if the cancer has been shown to be estrogen-receptor positive. Advice from breast specialists, as well as fertility specialists, is often sought in this circumstance.

Fertility Preservation for Oncology Patients

Fertility preservation options for women

Women who are facing cancer treatment that could result in infertility sometimes consider fertility treatment as a means of preserving their fertility. This treatment could involve chemotherapy that damages eggs and depletes ovarian reserve; radiotherapy in the region of the ovaries that can damage eggs or surgery to remove the ovaries or uterus. As the woman's oncology therapy is always first priority, these fertility preserving options are not always appropriate or relevant. However some of the options include the following:

1. IVF with embryo freezing

If a woman is in a stable relationship with a person whom she would wish to have children with, IVF with a view to create embryos to freeze might be appropriate. This will only be an option if the IVF treatment does not compromise or delay cancer treatment by an unacceptable amount of time. This is a decision your oncologist and your consultant at fertility plus will discuss.

2. Egg freezing

Under the HART Act (2004) egg freezing is deemed to be an established procedure. Fertility clinics have been successfully freezing sperm and embryos for decades, but initially eggs had a much lower survival rate after freezing and thawing than did embryos. However, it is now established that by using a different method of freezing (vitrification), the results are very similar to those for embryos. The fertilisation rate may be a little lower for warmed eggs compared to fresh eggs, but the implantation of the embryos is expected to be very similar. Fertility Plus now offers vitrification of eggs. Although this is a relatively new technique, it is being carried out in the laboratory by very experienced embryologists. Fertility Plus has not yet warmed and inseminated any eggs which have been vitrified.

This procedure requires the woman to undergo an IVF cycle however the eggs are frozen immediately following egg collection.

4. Gonadotrophin Releasing Hormone (GnRH) therapy

GnRH therapy might reduce the chance of damage to your eggs from chemotherapy although there is limited evidence showing any benefit from this therapy.

Fertility preservation options for men

Some medical interventions such as chemotherapy, radiotherapy or surgery, may temporarily or permanently affect sperm quality or result in sterility. Semen cryopreservation prior to these treatments is therefore an important option to consider for men who have not had children or whose family is not yet complete.

1. Sperm freezing

A sample can be produced by masturbation and subsequently frozen and stored at a very low temperature in liquid nitrogen. If time allows, the patient may wish to freeze multiple samples prior to starting cancer treatment.

2. Testicular biopsy

If a patient is undergoing urgent surgery and or it has not been possible for him to produce a sample by masturbation for sperm freezing, it may be possible for the surgeon to remove a small piece of testicular tissue during surgery. This tissue can be processed by Fertility Plus and can be frozen if sperm are found.

Glossary of terms

Adhesion:	As related to infertility, the adhering of ovaries, tubes, uterus, bowel or abdominal lining to each other. May follow pelvic surgery, tubal infections or endometriosis.
Androgens:	Male sex hormones.
Anovulation:	The absence of ovulation. A period may still occur.
Antisperm antibody:	Protein complexes found in blood, mucous and semen, which bind to specific sites (called antigens) on the surface of the sperm. They are found in both men and women and are produced by an immune response to semen.
Azoospermia:	The absence of sperm in seminal fluid either due to blockage of sperm ducts or an impairment of sperm production.
Biochemical pregnancy:	Where a positive hCG blood test results, however the level does not rise appropriately and eventually will decrease. Embryo implantation has occurred but is not sustained.
Blastocyst	A stage of embryo development. An embryo must reach blastocyst stage on day 5- 6 of development to gain the ability to implant in the womb.
Catheter:	A fine tube with a syringe attached, especially developed for transferring sperm or embryos into the woman's uterus.
Cervical Mucus:	Secretions produced by the cervix. At the time of ovulation the consistency of the mucous changes in order to assist the passage of sperm through the cervix. Just prior to ovulation this mucus plug becomes clear and sticky, the consistency is likened to raw egg white.
Cervix:	A tubular muscle approximately 2cm long at the neck of the uterus connecting the uterus to the vagina. At the vaginal entrance there is a small muscle with a mucus plug to prevent unwanted organisms entering the uterus. This is called 'fertile mucus' and is necessary for the passage of sperm into the uterus. The small muscle entrance from the cervix into the vagina (called the external os) also opens during this time. At the neck of the uterus there is a stronger muscle called the internal os.
Cleavage stage embryo:	Embryos from the 2 cell stage until compaction (from day 1-4 of development).
Clinical Pregnancy:	A positive hCG test and ultrasound evidence of a fetal sac and heartbeat.
Donor Egg:	Eggs taken from one woman and donated to another.
Donor Sperm:	Sperm donated by a man who is not the woman’s partner to be used for artificial insemination, IVF or ICSI.
Down Regulation:	This refers to the 'shutting off' of the messages from the pituitary gland to the ovary, enabling control over the events in a cycle.
Estradiol:	The female sex hormone (Estrogen) which is produced by the follicle where the egg is developing. It is also produced by the placenta in pregnancy.
Ectopic Pregnancy:	A pregnancy in which the fertilised egg implants outside of the uterine cavity, usually in the fallopian tubes, or very rarely on the ovary or the abdominal cavity.
Ejaculation:	Semen released from the penis during orgasm.

Embryo: A name given to the fertilised egg in its earliest stages of development.

Embryo Transfer: The placement of embryos into the womb or fallopian tube using a fine catheter.

Endometriosis: The presence of endometrial tissue (the normal uterine lining) outside the uterus, such as in the fallopian tubes, ovaries and abdominal cavity.

Endometrium: The lining of the uterus which grows and sheds each cycle.

Fallopian Tubes: Two tubes approximately 10-14 cms long, connecting the uterus with the ovaries. Their function is to carry the egg from the ovaries to the interior of the uterus and the sperm from the uterus to the egg. They contain minute hairs to guide the passage of the ova. Fertilisation occurs in the fallopian tube.

Fertilisation: The penetration of the egg by the sperm to create an embryo.

Follicle: A structure within the ovary in which an egg develops. It is from the follicle's lining that estradiol is produced in the follicular phase, then progesterone in the luteal phase.

FSH: Follicle Stimulating Hormone. It is a gonadotrophin hormone secreted by the pituitary gland, which lies beneath the brain. This hormone stimulates the ovary to promote the development of an egg inside a follicle.

Gonadotrophin: A group of hormones which are capable of stimulating the testicles or ovaries to produce sperm or eggs respectively. The most common types are FSH and LH.

hCG: Human Chorionic Gonadotrophin. The presence of hCG hormone in blood or urine confirms a pregnancy. A blood test for hCG is taken 16 days after an IVF egg collection. The hormone is produced an implanted embryo. Once implantation has occurred and is established, this hormone level rises very fast to ensure the endometrium lining remains intact i.e. stops a period occurring.

Hormone: A substance which is released from special glands into the blood stream and stimulates other glands or the tissues into activity.

Hormone Assay: The measurement of hormones present in the blood.

ICSI: Intracytoplasmic sperm injection. The injection of a single sperm into the centre of an egg to encourage fertilisation. This technique is used when the number of sperm are low.

Implantation: The embedding of an embryo in the endometrium of the uterus.

Infertility: The inability to conceive or carry a baby to term after one year of unprotected sexual intercourse.

Intrauterine insemination: The placement of prepared sperm into the uterus using a fine insemination catheter.

Laparoscopy: A surgical operation using a telescope-like instrument to have a look at the pelvic organs.

LH: Luteinising Hormone. It is an ovary-stimulating hormone whose function is to promote the release the egg from the ovary into the fallopian tube. It also plays a role in changing the function of the ovulated follicle to start producing progesterone. Progesterone helps to maintain the lining of the uterus and prepare for implantation.

Male Factor Infertility:	Where the male partner's sperm is below normal limits as defined by the World Health Organisation.
Male Masturbation:	Manual stimulation of the penis to achieve ejaculation.
Oligospermia:	An abnormally low number of sperm in the seminal fluid.
Oocyte:	The egg cell produced in the ovary, also called ovum, egg or gamete.
Ovulation:	The release of a mature egg from the ovary.
Ovulation Induction:	The use of medication to promote ovulation in women who normally do not ovulate.
Progesterone:	Female sex hormone produced by the corpus luteum on the ovary (ovulated follicle). Progesterone helps to maintain the lining of the uterus and prepare for implantation.
Pituitary:	A gland located at the base of the brain that produces and secretes a number of important hormones that play a role in growth, development and reproduction.
Semen:	The fluid that is released during ejaculation. This fluid contains sperm cells and other secretions which assist the sperm to swim through the female reproductive tract.
Sperm:	The reproductive cell of the male.
Testicle:	The male sex organ where sperm production occurs.
Uterus:	The womb. A pear shaped muscular organ situated in the pelvic cavity between the bladder and the rectum. Its function is the nourishment and protection of the fetus during pregnancy.
Ultrasound:	Ultrasound machines use sound pressure waves to generate images of internal organs. Ultrasound can detect the presence of cysts and other problems, follicle development, pregnancy and other masses.

Support Groups

Fertility NZ
Telephone: 0800 333 306
email: support@fertilitynz.org.nz

Freepost
P.O. Box 12049
Beckenham
Christchurch

www.fertilitynz.org.nz

Support groups
cg.fnzauckland@gmail.com
casualcoffeegroup@gmail.com

Endometriosis NZ
Telephone: 0800 733 277

P.O. Box 1673
Christchurch

www.nzendo.co.nz

These organisations can also help you to find a support group in your local area.

Patient Advocate Service

The Patient Advocate Service provides independent health and disability advocacy to ensure that the rights of people are upheld. This is a free and confidential service within the Northern Regional Health Authority Area. They can help you to:

- Know your rights.
- Know how to access your records.
- Understand the health care system.
- Communicate with health care personnel.
- Make a complaint regarding your treatment or care.

Suggested Further Reading

http://www.fertilitynz.org.nz has a list of potentially useful links to websites that may be informative.

Dietary advice

Refer to www.moh.govt.nz or www.healthyfood.co.nz for dietary advice that may be useful whilst trying to conceive.