INFERTILITY

Services - Part 2

Imprint

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These articles were compiled by **http://www.ivfvictoryphilippines.com/** in hopes of helping bring into light infertility questions and bring solutions for many couples and / individuals having a hard time conceiving.

Victory A.R.T. Laboratory Phils, Inc. is part of the Hong Kong based Victory Group of A.R.T. Laboratories and is the pioneer IVF laboratory here in the Philippines. Established in and spearheaded by **Dr. Gregorio Pastorfide**, a re-knowned and internationally acclaimed OB-GYN, Victory continues to assist and provide infertility solutions using state-of-the-art equipment and an ever-growing and adapting medical team.

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We thank you everyone who visited our website for information regarding IVF. We have come a long way in providing articles to hopefully aid and support everyone thinking of undergoing the process.

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We aim to please. :) Thank you.

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Table of Contents:

Intracytoplasmic Sperm Injection

Intracytoplasmic Sperm Injection (ICSI) is a procedure where a sperm cell is injected directly into an ovum in vitro. ICSI is recommended for couples faced with male infertility, such as *low sperm count*, *poor sperm motility*, *poor sperm quality*, *sperm unable to penetrate an egg*; or *azoospermia, the absence of sperm in semen*.

Sperm may be retrieved from the male partner through normal ejaculation, however there are indications for alternative methods of retrieval, especially in cases where the patient has azoospermia due to obstruction.

Needle aspiration allows for sperm retrieval to be done quickly and easily. This procedure is usually done under sedation, with minimal discomfort. If the man had previously undergone a vasectomy, ***microsurgical vasectomy reversal*** can be performed, thereby allowing sperm to be released during ejaculation as per normal.

ICSI is performed according to the following steps:

1. Under high-power magnification, a specialized pipette is used to hold the mature ovum in place.
2. Using a delicate, sharp hollow needle, a single sperm cell is aspirated for injection.
3. The needle is carefully inserted through the oolemma (i.e. outer shell) and into

the cytoplasm of the ovum.
4. The sperm is injected into the ovum's cytoplasm to achieve fertilization, and the needle is withdrawn.
5. The ovum is examined for evidence of successful fertilization.

Intracytoplasmic sperm injection differs from natural fertilization in several important ways. Under normal circumstances, sperm compete for fertilization and only the most mature, viable sperm cell penetrates the ovum and is allowed to fertilize the egg. In place of this feature, a selection device is used to harvest the most mature sperm cells for ICSI. Mature sperm cells are of high quality, showing fewer DNA strand breaks and lower levels of aneuploidy (i.e. abnormal number of genes or chromosomal regions). Thus, the sperm cell that is injected into the ovum would have had a good chance of fertilizing it naturally.

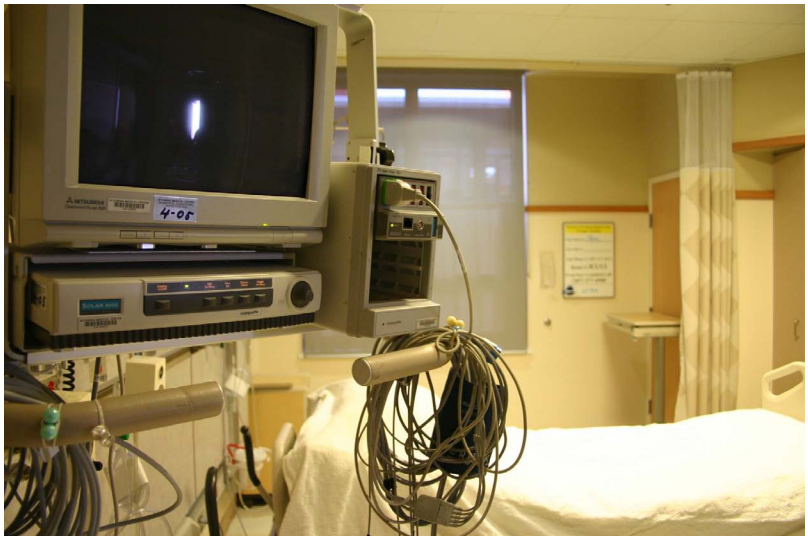
After repeated unsuccessful traditional IVF trials, ***intracytoplasmic sperm injection*** can be implemented to enhance the fertilization phase of *in vitro fertilization*, and in some countries, ICSI technology is implemented right away. Using healthy ova of good quality, ICSI is successful in treating men with impaired sperm or azoospermia. It is also useful for couples interested in testing for genetic disorders. Since only one sperm cell is used for fertilization, false positive genetic testing results due to contamination of the sample by other sperm cells can be ruled out.

In Vitro Fertilization & Embryo Transfer (Part 1)

For couples who have been unsuccessful in their attempts to conceive, *in vitro fertilization* and *embryo transfer* allows them a chance at establishing a pregnancy.

Superovulation

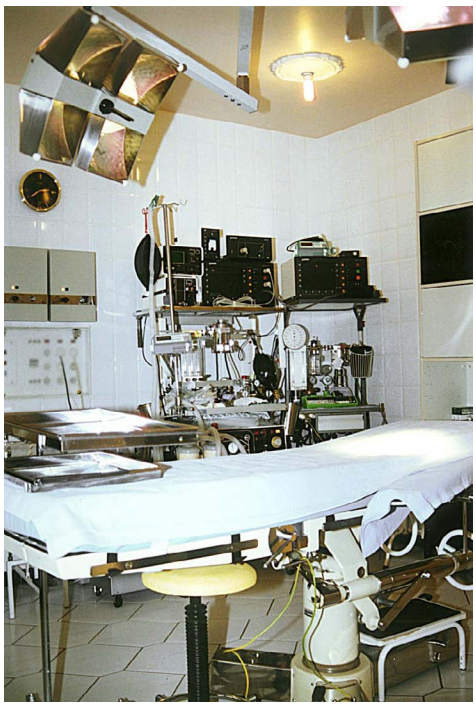
Once a couple has been referred for assisted reproductive therapies and have been deemed good candidates for in vitro fertilization, both of them undergo a physical examination and assessment. ***Superovulation*** is a controlled technique, designed to stimulate the female partner's ovaries to produce several oocytes in a cycle, rather than the usual single egg. Multiple eggs allow for multiple attempts at fertilization, and even the availability of multiple embryos. ***Superovulation*** ultimately increases the success rate of IVF and is thereby a common technique.



Medications used in superovulation include *gonadotropin-releasing hormone agonists*, *follicle-stimulating hormone*, *luteinizing hormone*, and *human chorionic gonadotropin*. These hormones are administered to the female partner by subcutaneous or intramuscular injection. With the resultant production of multiple ova, hormone levels of estrogen and progesterone reach levels that are much higher than normal, so there are frequent tests that are performed to monitor the body's response to the medications.

While ovulation induction is taking place, follicular growth is tracked using transvaginal ultrasound. These vaginal sonograms may be repeated as the time for oocyte retrieval approaches.

Oocyte Retrieval



Oocyte retrieval is performed while the patient is under sedation. The fertility specialist collects the ova by inserting a needle through the vaginal wall into the ovaries. This is usually facilitated by transvaginal ultrasound guidance to locate each follicle. Once the follicles are located, the follicular fluid and the eggs are aspirated into a test tube. The procedure takes about half an hour, and the patient is usually discharged within hours of retrieving the oocytes.

Semen Collection and Preparation of Sperm

The male partner submits a semen sample, usually through masturbation, on the same day of oocyte retrieval, and usually while the procedure is in progress. Abstinence from ejaculation anywhere from two to five days prior to collecting the specimen, to ensure a high sperm count at the time of collection. After the sample is collected, the sperm are prepared for inseminating the ova harvested from the female partner. In cases where producing a semen sample is not possible on the same day of oocyte retrieval, men can elect to have samples frozen in advance, or undergo testicular biopsy to extract sperm.

Intrauterine Insemination (IUI)

Intrauterine insemination, or **IUI**, is a procedure in which a man's sperm is placed directly into woman's uterus. The woman's eggs and ovaries are not affected or manipulated in this process. The goal of IUI is to facilitate fertilization by increasing the number of sperm that can reach the fallopian tubes, therefore increasing the chance of fertilization and subsequent pregnancy.

Couples who have struggled unsuccessfully for at least one year to get pregnant elect to undergo ***intrauterine insemination*** due to a variety of health conditions. These conditions are often *low sperm count, decreased sperm mobility, abnormally thick cervical mucus, cervical scar tissue that inhibits the normal passage of sperm into the uterus*, and *ejaculation dysfunction*. These conditions prevent sperm from reaching their destination. For whatever reason, sperm are unable to ascend up the female reproductive tract, or are simply not built to survive the journey. Simply put, IUI gives sperm cells a head start.

It is important to note that IUI does not facilitate fertilization or the events that take place at that point, such as the acrosomal reaction and the act of penetrating the egg. Thus, it may be important to determine whether the donor sperm are somehow otherwise impaired. This can be done during a *semen analysis* or *sperm morphology examination*.

Intrauterine insemination is a fairly simple procedure. The female partner is given medications to stimulate egg production, and insemination is timed to occur simultaneously with ovulation. The male partner provides a semen sample, which is submitted after two to five days of abstinence from ejaculation. The sample is washed to separate sperm from seminal fluid. Then a catheter is placed intravaginally, through the cervix and into the uterus, and sperm cells are injected directly into the uterus. This procedure takes very little time and involves very little discomfort. Moreover, the risks for complications are also minimal.

After undergoing ***intrauterine insemination***, the couple should be on alert for signs and symptoms of pregnancy, such as a *missed period, headaches, breast tenderness or mastitis, and nausea*. Other symptoms include *spotting, fatigue and lower back pain*. These signs and symptoms may be observed within a week of conception, but they may also begin to happen a few weeks later.

The success rates for IUI has been seen to be variable, often due to factors such as the health of the *man's sperm*, as well as the health of the *woman trying to get pregnant*. Women under age 35 can expect a higher success rates than their older counterparts.

Hormonal Tests Including Pregnancy Test

Hormonal tests are an integral element in female fertility testing and assisted reproductive therapies. They are also an important part of the initial examination for couples who have been trying to get pregnant for at least one year, but to no avail. These tests are useful since they help determine causes of *infertility*, and whether infertility may be due to other health conditions.

Luteinizing hormone – produced by the pituitary gland, this hormone is responsible for regulating a woman's menstrual cycle and ovulation. Normally it increases rapidly just before ovulation, midway through a menstrual cycle. Testing for ***luteinizing hormone*** is usually done to evaluate menstrual problems, such as *irregular periods* or *amenorrhea*, or determine the response of a woman's body to medications prescribed to stimulate ovulation. It is also given to determine whether a woman has undergone menopause.

Follicle-stimulating hormone – also produced by the pituitary gland, ***follicle- stimulating hormone*** helps control the menstrual cycle as well as oocyte production by the ovaries. FSH levels vary according to a woman's menstrual cycle, and peak just before ovulation. The test for FSH helps determine the cause of infertility by ruling out whether the ovaries are functioning properly, and to determine a woman's supply of oocytes. Testing for this hormone may also be indicated to evaluate menstrual problems, as well as diagnose disorders of the pituitary gland. It can also be indicated to evaluate precocious or delayed puberty in teenage girls.

Estrogen – produced by the ovaries, this hormone actually exists as three types: *estradiol, estriol* and *esztrone. Estradiol* is most commonly measured in women who are not pregnant, and it varies throughout the menstrual cycle. *Estriol* is only measured during pregnancy, and can be detected during as early as the first trimester. As such, it can be produced not only by the ovaries, but also the placenta. *Estrone* is measured in women who have gone through menopause. Indications for

testing for estrone also include evaluating tumors of the adrenal glands or ovaries.

Progesterone – produced by the ovaries during ovulation, this hormone functions to prepare the endometrium lining of the uterus for implantation of a fertilized egg. During pregnancy, the placenta also produces ***progesterone***, starting in the latter weeks of the first trimester. Levels of this hormone are tested to determine causes of infertility, to find out whether ovulation is occurring normally, as well as to monitor the function of ovaries and placenta in pregnant women.

Prolactin – produced by the pituitary gland, this hormone is responsible for milk production. Pregnant women can have ***prolactin*** levels 20 times as high as their non-pregnant counterparts, and these levels may remain high if they are breastfeeding. Testing for ***prolactin*** is indicated for women who suspect that they are infertile, or have abnormal nipple discharge, or to determine the presence of a pituitary gland tumor.

Free T3 – one of two hormones produced by the thyroid gland, T3 is responsible for regulating metabolism in every cell of the body. Low levels of ***free T3*** coincide with low levels of progesterone, which may indicate problems with ovarian function. Testing for not only ***Free T3***, but also the ***Free T3***/Reverse T3 ratio is often recommended for women who have trouble getting pregnant.

DHEA – also known as ***serum dehydroepiandrostenedione sulfate***, ***DHEA*** is produced by the adrenal glands, ovaries, as well as the brain. Abnormally high levels of this hormone can be seen in women and girls with polycystic ovarian syndrome, which can cause female infertility.

Androstenedione – produced by the ovaries and brain, levels of this hormone are also measured to determine whether female infertility can be due to *polycystic ovarian syndrome*.

Pregnancy Test – this test determines the presence of the *hormone human chorionic gonadotropin*, or hCG. Produced by the placenta, this hormone is present in the woman's bloodstream as soon as a fertilized egg has implanted in the endometrium layer of the uterus. hCG is also found in the *urine*, and this explains why urine samples and blood samples can both be used to determine whether pregnancy has been achieved.

Micro-epididymal Sperm Aspiration

Micro-epididymal sperm aspiration (MESA) is an outpatient microsurgical procedure for collecting sperm in men who have an absence of sperm in their ejaculate, generally known as azoospermia. There may be several reasons for this, such as poor motility or blockage of the male reproductive duct. *Azoospermia* can be seen in men who have been diagnosed with absence of the vas deferens, which occurs in cystic fibrosis. However, cases where such a blockage occurs intentionally, such as a prior vasectomy, are far more common.

Similar to other assisted reproductive therapies, ***micro-epididymal sperm aspiration*** may be suitable for couples who have been unable to conceive despite having tried for at least a year, and have identified the cause as a male-related disorder. Additionally, semen and sperm morphology analyses may be done prior to MESA to determine whether it is appropriate. Generally, men whose sperm have been shown to have poor motility are also candidates for this procedure.

Micro-epididymal sperm aspiration is performed by a consultant urologist. The patient is placed under general anesthesia. Once he is sedated, the urologist makes a small incision in the scrotum to expose the epididymis, the duct that stores the sperm, located behind each testis.

Although most men may be understandably intimidated by the idea of testicular biopsy, *TESE is a simple, relatively low-cost, and virtually pain-free operation.* As soon as the sperm are harvested, they are often prepared for ***intracytoplasmic semen injection*** to be performed on the female partner on the same day.

General and reproductive health of both the male and female partner contributes to the success of this procedure towards resulting in pregnancy. Since absence of the vas deferens can be a feature of cystic fibrosis, which in turn is due to a chromosomal abnormality, both partners should undergo genetic counseling to help them consider the best option for treating infertility.

Testicular Sperm Extraction (TESE)

Testicular sperm extraction is a surgical procedure for collecting small specimens of testicular tissue and extracting viable sperm cells. Like other microsurgical procedures, such as *micro-epididymal sperm aspiration* (MESA) and *percutaneous epididymal sperm aspiration* (PESA), this procedure is done in an outpatient setting. However, there are some differences. Instead of undergoing general anesthesia, the donor is placed under local anesthesia with sedation. Also, in TESE, the sperm cells are harvested from the testes themselves, not the epididymis.

Men who have been diagnosed with azoospermia, caused by the absence of the vas deferens, or due to prior vasectomy, are good candidates for testicular sperm extraction. Additionally, men who are suspected of having non-obstructive azoospermia (i.e. a malfunction within the testes may be at fault) may benefit from TESE, since both MESA and PESA would not be successful at harvesting viable sperm.

After semen analysis and sperm morphology have been performed, and the patient has been advised and referred for testicular sperm extraction, the surgery is scheduled. Since TESE is a procedure that must coincide with intracytoplasmic semen injection, it must be done at the same time the female partner is undergoing ovulation.

At the start of the procedure, the patient is prepped, and the anesthesiologist administers the patient a local anesthetic and a sedative. TESE is an open surgical procedure, which is performed under direct vision. This allows for fewer complications to occur. An incision about 10 mm in length is made in the skin, allowing a small slice of testicular tissue to be removed. The patient would recover within hours, and can be sent home to return to normal activity within the same day.

Testicular Biopsy for Diagnosis of Male Infertility

Male infertility can be thoroughly evaluated using several diagnostic techniques. From semen analysis to sperm morphology, as well as several blood tests for hormones such as testosterone. **A testicular biopsy** is a surgical procedure where a small sample of testicular tissue is removed from the scrotum. It is then examined under a microscope for the presence of sperm.

Unlike Testicular sperm extraction, which harvests testicular tissue for the sperm within, ***testicular biopsy*** is a diagnostic modality.

It is usually warranted when two conditions are present:

- There is no sperm in the man's semen.
- Test results for hormones are normal.

Contrary to popular belief, ***testicular biopsy*** is not usually done to determine whether the patient has testicular cancer. In such cases, orchiectomy is performed. Also, good candidates for ***testicular biopsy*** would include men who have been trying unsuccessfully to conceive with their partners for at least a year, and there are no problems found in the female reproductive system.

To prepare for a ***testicular biopsy***, a complete medical history and physical examination must be performed and documented. This includes going over any blood disorders, allergies to medications, and current medications being taken. The biopsy may be performed under local or general anesthesia. If it is the latter, then the consultant urological surgeon advises the patient to fast several hours prior to the procedure.

The incision for ***testicular biopsy*** would be roughly one centimeter in length on the scrotal sac, and a small sample of testicular tissue is harvested from each testis using surgical scissors. The testes are then stitched closed as is the

overlying skin using absorbable sutures. Then the wound is bandaged, and the patient is allowed several hours to recover.

Most patients are advised to wear an athletic supporter for several days after the procedure, and to refrain from sexual activity for one or two weeks. There may be some soreness for a few days after the operation, however there is no risk of urinary or erectile dysfunction as a result of a ***testicular biopsy***.

The sample of testicular tissue is sent to the pathology lab for microscopic examination. There, pathologist determines the presence of abnormalities in sperm maturation or even sperm production. As soon as the results of the biopsy have been verified, they are forwarded to the urological surgeon, who will then advise the patient of the definitive diagnosis, as well as the next step in treating infertility.

"Change your thoughts and you change your world."

~ Norman Vincent Peale

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