IN VITRO FERTILIZATION
AND
EMBRYO TRANSFER

1535 Dresden Row, Suite 213
Halifax, Nova Scotia
B3J 3T1

Phone: (902) 404-8600
Fax: (902) 404-8601

Website: www.aart.ca
E-Mail: info@aart
IN VITRO FERTILIZATION

INTRODUCTION

Infertility is a common problem affecting one out of every six couples. There are many causes of infertility. It may be due either to a male factor, a female factor, or a combination of factors. When traditional treatments fail, in vitro fertilization (IVF) may offer the chance of achieving a pregnancy. IVF and other assisted reproductive therapies also offer the chance for same sex couples and single people to achieve a pregnancy. IVF is a procedure in which egg(s) are removed from follicles in the ovary and then fertilized by sperm cells outside the body. Each fertilized egg develops in a special dish for three to six days and the embryos resulting are then inserted back into the uterus.

In general, the chance of achieving pregnancy through IVF is approximately 50 percent for a complete treatment cycle, although the rate declines after age 36. This is higher than the expected conception rate per monthly menstrual cycle for any typical fertile couple. There is no guarantee that an IVF cycle will result in a successful pregnancy.

PREPARATION FOR IVF

The initial consultation will provide a patient with the opportunity to become familiar with the process of IVF. It includes clinical histories and a physical examination.

1. Blood tests (Patient and Partner) are done to determine your blood type and to screen for certain viruses; one of these is the HIV test.

2. Male Factor Assessment (if male partner)

   It is important that a sperm functional analysis be obtained prior to your IVF treatment cycle. The fee for this test is not included in the basic cost of IVF. A separate brochure is available which explains the details and rationale of this investigation. Patients with low sperm numbers or other sperm abnormalities on this test may be suitable candidates for Intracytoplasmic sperm injection (ICSI).

THE IVF TREATMENT CYCLE

In normal reproduction, the ovary releases one egg (oocyte). In IVF, medication is given in order to encourage a larger number of mature eggs. Eggs develop in small fluid spaces (follicles) in the ovary. As follicles grow, the hormone estradiol is produced. When estradiol reaches a certain level and the follicles reach an appropriate size, another hormone, luteinizing hormone (LH) is released which is the driving force that is necessary for final maturation and release of the egg. This process is known as ovulation. During the IVF treatment, human chorionic gonadotropin (HCG) is given as an injection which works in a similar way to LH, and the eggs are collected before ovulation can take place. When a couple chooses IVF, the medical team helps them proceed through this sequence of biologic events.
STEPS IN IVF

1. IVF MEDICATIONS FOR OVARIAN STIMULATION

AART has various protocols to stimulate the ovaries that use various combinations of the following medications to produce multiple mature eggs (oocytes).

a) **Suprefact (Buserelin Acetate) or Lupron (Leuprolide Acetate)**

   Administration of Suprefact or Lupron causes suppression of ovarian function by shutting down hormone secretion by the pituitary gland. This “shut down” occurs within two to three weeks after starting treatment. Suprefact is administered by nasal spray and Lupron is administered intramuscularly or subcutaneously. Side effects associated with this medication are uncommon. Occasionally women experience hot flushes, a decrease in libido (sex drive), or local reaction at the injection sites. Rarely, a rash may be associated with the use of these drugs.

b) **Gonadotropins (Gonal-F and Menopur)**

   These hormones stimulate the follicles to grow. These medicines can be self-injected (you will be taught how to do this). Gonal-F is a pure form of FSH (Follicle Stimulating Hormone) which has been synthetically produced. Menopur is a mixture of FSH and LH (Luteinizing Hormone). These can be administered subcutaneously or intramuscularly. Side effects from gonadotropins may include local irritation at the injection site, mood swings, and hot flashes. Overstimulation of the ovaries (hyperstimulation) may also occur. If the ovaries become overstimulated, treatment with gonadotropins may have to be stopped and the cycle cancelled or the embryos are frozen in what is referred to as a “freeze-all” cycle where the embryo(s) are transferred in a subsequent frozen embryo transfer cycle.

c) **Human Chorionic Gonadotropin (HCG) “Trigger Shot”**

   HCG is a hormone that acts in the same way as the natural hormone LH. LH, or luteinizing hormone, normally is produced by the pituitary gland and acts as a final “driving mechanism” to mature the eggs. HCG is given by subcutaneous injection into the abdomen or leg. Following the administration of HCG, retrieval of the mature eggs is performed approximately 36 hours later. Side effects associated with HCG include mild fatigue, depression, or some discomfort in the area of the injection. Lower abdominal bloating or pressure may also occur.

d) **Progesterone**

   Progesterone is the hormone which is produced naturally after ovulation occurs in a normal cycle. It is responsible for supporting or maintaining the lining of the uterus. Thus, if fertilization does occur, the developing embryo will find the lining of the uterus receptive to implantation and growth.
Progesterone is usually given by vaginal suppository. However, it can also be administered by vaginal cream or by intramuscular injection. Women are given progesterone vaginal suppositories commencing the day after the oocyte ("egg") retrieval procedure. Side effects associated with progesterone include fatigue, dizziness, bloating, and breast tenderness. These are to be continued every day until the end of 11 weeks of pregnancy or the result of a negative pregnancy test.

e) Estrace

Estradiol (Estrace) is a hormone which is produced by the developing oocyte and then the developing pregnancy. There is some evidence that additional support may increase success in an IVF Cycle and there is no evidence of any detrimental effects. Estrace is taken orally or vaginally after oocyte retrieval.

2. MONITORING OF THE OVARIAN STIMULATION

a) Blood Tests

Blood testing allows team members to follow the growth and development of follicles. These blood tests are done each morning on a first come, first serve basis between 7:30am and 8:30am at AART. Patients must be on time. Blood is tested for estradiol and other hormones as necessary. These hormone results are reviewed daily by the IVF team and they discuss adjustment to medication and/or decisions on treatment at this time. You will be informed of the results.

b) Ultrasound Examination

Ultrasound examinations are performed as appropriate at AART once monitoring of follicle development begins. Occasionally unscheduled ultrasound examinations may be necessary, depending upon blood results. Therefore, patients need to be available daily once monitoring begins.

A vaginal ultrasound procedure is used to monitor the development of ovarian follicles (fluid-filled sacs which contain the eggs). An ultrasound probe is inserted into the vagina. Most women find this examination to be less uncomfortable than a pap test. The ovaries with the developing follicle are shown on the monitor. Unlike an abdominal pelvic ultrasound, an empty bladder is required. A feeling of pressure may be associated with this procedure, but it is otherwise painless. Both the size and the number of follicles are measured and recorded. Not all follicles contain a mature egg (oocyte).

c) Cancellation

Some patients will have their cycle cancelled (less than 10%). Cancellation may be necessary if the ovaries do not respond enough to the medications or if they respond too much.
When the ovarian follicles are mature (correct size as seen on the ultrasound, proper hormone levels according to the blood tests), ovulation is triggered by an injection of human chorionic gonadotropin hormone HCG or Lupron in the late evening at a specified time. The egg retrieval is scheduled in the morning of the second day following the injection.

3. **EGG “PICKUP” (RETRIEVAL)**

Patients are admitted to AART as outpatients in the morning one hour prior to pickup (oocyte retrieval). You must be fasting (nothing to eat or drink) since midnight. An intravenous infusion (IV) is started before this procedure and sedatives are given. Your partner may be present for this procedure. Discomfort is well controlled with medication for pain.

To retrieve mature oocytes (eggs), a vaginal ultrasound probe is used to guide the aspiration needle. Oocytes are removed from the follicles by suction. This technique is known as **follicle aspiration**.

After sedation and pain relief has been given, the aspiration needle is inserted into each follicle. Suction is used to drain the fluid from follicles into a test tube. An embryologist examines the fluid under a microscope to identify the eggs (oocytes).

After the procedure you will be monitored in the recovery area at AART. Once released, you should rest at home for 24 hours after your OPU. It is not recommended to drive a car in the 24 hours after OPU because of the medication used for conscious sedation. You should not work during this time. You may experience abdominal cramping and bloating. You can call our nurses line with any questions or concerns.

4. **INSEMINATION AND FERTILIZATION**

All partners involved in an IVF cycle are advised to refrain from ejaculation (“save up”) for 2-5 days prior to the expected day of egg pickup. This is to ensure that enough sperm will be available for fertilization of the eggs.

The semen sample is normally supplied shortly after the oocyte pickup. The patient will be given a sticker which they must confirm and label their sample with. Sperm from the specimen are washed by an embryologist and then placed into the culture dishes along with the oocytes. These dishes are kept in an incubator in the IVF laboratory. If sperm microinjection (ICSI) is being used or has been recommended as part of your treatment, then you will have been provided with a separate brochure on that topic and asked to sign a consent form for that laboratory procedure.

Occasionally, the sperm sample provided on the day of oocyte retrieval is not as expected, and the IVF treatment plan must be revised and ICSI recommended. In this situation, the laboratory or medical staff will endeavor to contact the couple to fully explain the situation, answer all questions and concerns, and obtain consent. The timing of ICSI in relation to
fertilization success is crucial and if the couple cannot be contacted in a timely manner, then the laboratory staff has the discretion to proceed with ICSI. The procedure will be done in this unusual situation without prior payment; however, payment for ICSI must be made in full prior to embryo transfer. This situation is outlined in the consent document “Consent to undergo a treatment cycle of In Vitro Fertilization (IVF) section 9.

The next day the eggs are examined for signs of fertilization. **Not all eggs become fertilized and/or grow to a blastocyst stage (embryo).**

5. **EMBRYO TRANSFER**

If the embryos develop and divide properly, transfer is usually performed on the fifth day after the pickup. Allowing embryos to develop to the blastocyst stage is a way of allowing for selection of the most viable embryos for transfer and has been shown to give good results with the transfer of just one or two embryos. Occasionally a day three transfer may be considered if there are only one or two embryos.

On transfer day you should arrive with a full bladder. The embryos are placed in a fine plastic tube called a transfer catheter by an embryologist. The doctor then passes this catheter through the patient’s cervix and into the uterus. Gentle pressure is applied to the end of the catheter and the embryo(s) are transferred into the uterus. No anesthetic or medication is required for this procedure. Usually transfers are painless. The partner is encouraged to be present; however, if this is not possible then a consent for transfer **MUST** be signed by **BOTH** partners prior to the transfer. The number of embryos transferred is at the physician’s discretion. Embryo freezing and storage is available at cost to patients who have more than one good quality embryo. Approximately 50 percent of patients would be expected to have embryos available for freezing.

**It is important to note that not all embryos are suitable for freezing.**

6. **GUIDELINES FOLLOWING EMBRYO TRANSFER**

A clear, pinkish discharge or spotting may appear following the transfer for 24 to 48 hours. This is quite normal. Spotting occurs when the cervical canal has been touched by the transfer catheter. Excessive bleeding should be reported to the IVF team. Couples are advised to refrain from intercourse for at least one week following transfer. Bouncing activities such as horseback riding or rigorous exercise should be avoided until the outcome of the IVF cycle is known. Otherwise, you may resume normal activities.

Progesterone suppositories may delay a menstrual period even if pregnancy does not result from an IVF treatment cycle. Thus, a delayed period does not necessarily mean that a pregnancy has occurred. **Progesterone should be discontinued only when you have a negative pregnancy test.** When a pregnancy is diagnosed, women should continue to use progesterone for the first three months of pregnancy. There is no known adverse effect of this medication on the developing fetus since it is a natural hormone of early pregnancy.
7. CONFIRMATION OF PREGNANCY

14 days following the embryo transfer, a pregnancy test is performed. A blood test known as a beta HCG measures the level of pregnancy hormone. When the blood test is positive, an ultrasound examination is scheduled approximately five weeks after the transfer. Ultrasound examination shows the location of the pregnancy, the presence of a fetal heartbeat, and the number of gestational sacs present.

Note: When you are pregnant, it is important to keep on taking progesterone and Estrace until the end of 11 weeks of pregnancy.

8. RISKS ASSOCIATED WITH IVF

There are some risks associated with the IVF procedure. Mild discomfort and bruising of the arm may result from repeated blood testing. The drugs used to stimulate the ovaries may cause severe overstimulation of the ovaries in one to three percent of cases. This hyperstimulation syndrome causes lower abdominal pelvic pain or cramping and spotting and can cause difficulties in breathing. This discomfort is due to the formation of excessively large ovarian follicles or cysts. Treatment may have to be stopped. Rarely, hospitalization and other therapies may be necessary to treat this condition.

The technique of vaginal ultrasound-guided pickup is usually associated with some discomfort. If it is significant, additional medication may be given during or after the procedure. Rarely there can be side effects and complications associated with medications used for sedation which may require medical treatment and/or transfer to hospital by ambulance. Risks include trauma to adjacent structures (such as bowel, bladder, blood vessels, and other pelvic structures). Rarely, an ovarian tissue rupture may occur. In less than one percent of cases, bleeding or a pelvic infection may also occur after the egg pickup.

If more than one embryo is transferred, a multiple pregnancy may occur (25-35% across Canada). In addition an embryo may implant in the fallopian tube (1 - 3% of cases). The resulting tubal pregnancy requires surgical removal since it can neither remain in the tube or be transferred back into the uterus.

10% of cycles may be cancelled before the egg retrieval. This can be for a variety of reasons, and does not necessarily mean that IVF cannot be offered in the future. Rarely, no eggs are obtained from an egg retrieval procedure. There is no known increased risk of abnormality in babies born as a result of IVF procedures.

Stress is inevitably associated with IVF procedures. This is particularly so in the waiting time after the embryo transfer. Patients are encouraged to contact AART for counseling or appropriate referral if there is a need.
9. ASSESSMENT AFTER FAILURE

All IVF cycles are reviewed by the entire IVF team regardless of outcome. This review normally takes place 2-4 weeks after the cycle is completed. A consultation (in person or by telephone) is then arranged with you (after the review is completed) to discuss treatment adjustments and to plan a subsequent IVF cycle if you wish.

10. CONFIDENTIALITY AND PUBLICITY

All patient information is confidential. However, the program must keep the medical and public communities informed about the status of the program. Any information released about the IVF program and its results is presented only in general terms. Patients’ names are never released. Specific details may appear in professional publications; however, patient identities are not revealed. Complete anonymity is maintained. No information about a patient’s progress or outcome in an IVF cycle is revealed to any other patient in the program.

11. PAYMENT AND FEES

The fee for IVF must be paid prior to orders being faxed to the pharmacy. Please note: patients who choose to satellite with a physician in their area, may incur additional charges for blood tests or ultrasounds performed at their local hospital. These charges are the patient’s responsibility and will not be reimbursed by AART.

12. PHARMACY

AART has an on-site pharmacy called Fertility Pharmacy Services that has all of the medications you need for your procedure. Our pharmacists are knowledgeable about fertility treatments and work closely with the AART team.
EMOTIONAL SUPPORT

AART works with qualified and trained personnel who can provide emotional support for patients being treated for fertility issues. These include:

Dr. Patricia Pearce MD (psychiatrist)
6155 North Street
Halifax, NS
Dr. Pearce sees patients by referral only. Please contact AART if you would like to be referred.

Lori Parker, MA (Registered Psychologist)
Fenwick Medical Centre
5595 Fenwick Street, Suite 314
Halifax, NS B3H 4M2
Phone: (902) 421-7514
Fax: (902) 421-1292
Patients may self-refer. A fee will be charged to the patient for Ms. Parker’s services. Many health plans will cover this cost.

Jessica Wine (Social Worker)
IWK Social Work Department
5980 University Ave.
Halifax, NS B3K 6R8
Phone: (902) 470-7989
Patients may self-refer or contact AART and ask to be referred.

Patient Resources

Fertility Matters Canada
fertilitymatters.ca
Fertility Matters Canada (FMC) is the national organization that empowers Canadians to help reach their reproductive health goals by providing support, awareness, information and education; and promoting equal access to fertility treatments.