

## ASSISTED REPRODUCTIVE TECHNOLOGY (ART)

Welcome to DFW Fertility Associates/ Presbyterian Hospital ARTS program. This document provides an overview of treatment protocols and more specific instructions on what is required of you for your ART procedure. After an initial consultation with your physician, some of your instructions and office visits will be with the nursing staff. However, the ART physician will be available to you at all times to answer your questions and manage your cycle.

You will meet other patients throughout your treatment cycle who are also undergoing treatment. It is imperative to realize that each person's response to therapy is individual. For this reason, you will find that your treatment and tests may differ from those of other patients. Please keep in mind that ART is a very private matter and that some patients do not feel comfortable discussing it even with family members. Therefore, we ask that you respect the privacy of others.

The entire cycle of ART lasts 4 to 6 weeks with the last 10 to 14 days requiring more frequent visits. Testing procedures will take time from your daily routine and will focus your thoughts on the desire for a child. Our group will work with you in every way possible to make this process successful and less stressful.

### I. ART PROCEDURES

#### A. In Vitro Fertilization (IVF)

IVF refers to the creation of embryos by placing sperm and eggs in a test tube or culture dish in a laboratory setting. In order to perform this procedure, oocytes (eggs) must be obtained by stimulating the ovaries with fertility medications, and then retrieving the oocytes from the ovaries by having the woman undergo a minor surgical procedure. This procedure is performed in an operating room after you are sedated with intravenous anesthesia. The oocyte retrieval involves the passage of a needle through the thin posterior wall of the vagina into the ovary and aspirating the oocytes from the ovary. After collection of the oocytes, the sperm and oocytes are prepared and then mixed together in the embryology laboratory in an incubator for the purpose of creating embryos. These embryos are allowed to grow in the incubator for an additional 3 to 5 days before being transferred. The transfer procedure uses a small tube placed through the cervix directly into the uterus with the hope that the embryos will implant in the uterus, and result in a pregnancy.

#### B. Intracytoplasmic Sperm Injection (ICSI)

ICSI is a procedure utilized to treat male factor infertility. It is performed in the embryology laboratory and involves the injection of a single sperm into an oocyte for the purpose of creating embryos. This procedure is a form of in vitro fertilization because fertilization occurs in a laboratory, but is different from "routine" IVF because the sperm is injected with microsurgical instruments into an oocyte. Couples with male factor infertility, prior demonstration of poor fertilization or polyspermic fertilization are candidates for this procedure.

#### C. Assisted Hatching

Assisted hatching is a laboratory procedure performed on embryos (not oocytes) that are 3 days old. This procedure involves the creation of an artificial opening in the zona pellucida, the glycoprotein coating or shell surrounding the embryo. While assisted hatching is performed in many ART clinics, this procedure is not clearly beneficial and even considered experimental by some physicians and clinics. As agreed upon by the ARTS team at Presbyterian Hospital, assisted hatching is *not* routinely performed for IVF. Only couples with individual treatment plans will be offered this procedure.

#### D. Cryopreservation

Cryopreservation refers to the freezing of excess embryos not transferred to the uterus. Approximately 1 in 4 couples undergoing an IVF procedure will have an excess number of embryos which may be cryopreserved (on culture Day 5 or 6). Good quality embryos may be cryopreserved or frozen (stored in liquid nitrogen) with the intention of later thawing (defrosting) these embryos for future pregnancy attempts. Pregnancy rates using frozen and thawed embryos are usually lower than fresh embryo rates.

#### E. Medications

1. Gonadotropins – hormones, specifically Follicle Stimulating Hormone (FSH) and Luteinizing Hormone (LH), which act directly on the ovaries to induce egg production. Gonadotropins are produced endogenously in the pituitary gland, but can be given in pharmacologic doses by way of fertility drugs. Currently, there are multiple brands of gonadotropins available commercially. Historically, the first generation of gonadotropins was produced by extracting FSH and LH from the urine of menopausal women, and purifying the preparations so that they were suitable for intramuscular or subcutaneous injection. Examples of these hMG (human menopausal gonadotropins) preparations include Repronex and Menopur. Another currently available preparation of human gonadotropins, Bravelle, contains FSH alone (second generation gonadotropins). Other commonly used gonadotropins include the ‘recombinant FSH’ preparations and are the product of genetic engineering technology. Examples include Gonal-F and Follistim.
2. Lupron – a gonadotropin-releasing hormone (GnRH) agonist acts on the pituitary gland to control the secretion of follicle stimulating hormone (FSH) and luteinizing hormone (LH). Initially Lupron causes a release of stored FSH and LH, but continual doses prevent further production of additional gonadotropins. Because of the initial release of gonadotropins during Lupron administration, Lupron must be given for at least 10 days before effectively suppressing pituitary production of gonadotropins. Lupron is an injectable medication administered subcutaneously in the thigh.
3. Antagon/ Cetrotide- are gonadotropin-releasing hormone (GnRH) antagonists- that act by directly inhibiting the release of FSH and LH from the pituitary gland. Your physician may recommend the use of these medications instead of Lupron for certain clinical situations. Because there is no initial burst or flare as with Lupron, these medications are started after the start of stimulation medications, usually around day 6 (typically). These medications are also given subcutaneously.
4. Human Chorionic Gonadotropin- (HCG) is a special type of gonadotropin that is given to mimic the LH surge and trigger ovulation. This is done because of the structural similarities between HCG and LH. After HCG is given, the final steps of egg maturation occur and the eggs are released from the ovary. Depending on the brand used, HCG can be given intramuscularly (Novarel, Pregnyl) or subcutaneously (Ovidrel) 36 hours before the oocyte retrieval procedure.
5. Progesterone- is a hormone that is vital for successful uterine implantation. Usually progesterone is only produced by the ovaries after ovulation (luteal phase). Progesterone supplementation is started after oocyte retrieval because natural production may be compromised by either the egg retrieval process itself or the medications used to down-regulate the pituitary. Progesterone is usually given as an intramuscular injection once a day (50 mg). Our nurses can provide tips to minimize this discomfort. In certain situations, a combination of oral progesterone (Prometrium) and intravaginal progesterone can be used for luteal support. If pregnancy is successful, progesterone supplementation is usually continued for an additional 5 weeks.

## II. PRE-CYCLE PROCEDURES

### A. Pretreatment Testing

Before undergoing an IVF treatment cycle, you should consult with your physician to discuss your treatment and prognosis. You may need some pretreatment testing in order to optimize your chances of pregnancy. Most women will need follicle stimulating hormone (FSH) and estradiol blood tests performed around the third day of their cycle. These tests will be used to help determine the initial starting dosage of your fertility medications. Additionally, most women should have a uterine evaluation (within 2 years) such as a hysteroscopy, hysterosalpingogram (HSG), or sonohysterography to ensure that the endometrial (uterine) cavity is normal. Most abnormal uterine cavities will need to be corrected before undergoing an IVF procedure. Your husband should have a semen analysis within the last 6 months.

### B. Cycle Initiation

Please call our office at 214-363-5965 (between 8:00 a.m. and 3:00 p.m., Monday through Friday) on the first day of menstrual flow and let the office know that you are calling to start an IVF cycle. You will also need to register with Presbyterian Hospital of Dallas at 214-345-2624, but our office will usually forward your demographic information to the ARTS department.

### C. Prestart Visit

Once you are accepted as a candidate for IVF, we will schedule an appointment for a prestart visit. During this orientation session, the nurse will review your treatment plan and instruct you *and your spouse* how to inject fertility medications. This will take approximately 1 hour.

Immediately before or after your prestart visit, you should have a registration/financial orientation with the ARTS department, located on the 1st floor of the Margot Perot building. You should have consent forms for your upcoming treatment at the time of these orientation sessions. Please review these consent forms, and have all questions answered before signing them. Please return the signed forms during your orientation. ***All patients must complete IVF, CRYOPRESERVATION, and ICSI consent forms before starting medications.*** A hospital representative will review your hospital financial obligation with you at that time.

### D. ARTS Orientation

The Presbyterian ARTS Program provides an embryology lab orientation twice a month (usually on Thursday, 5:00 p.m.). Although not mandatory, we strongly suggest attendance at one meeting. Please call 214-345-2624 to confirm attendance. You will have an opportunity to meet our IVF staff, including a member of the embryology lab, to discuss the laboratory aspects of your treatment if desired .

### E. Financial Obligations

You will have an opportunity to meet with our business manager to review the fee schedule. These financial obligations must be met in order to initiate and complete your treatment cycle. If you have insurance coverage for IVF, we must verify these benefits before initiating treatment. Your cycle may stop at any stage where your physician believes that successful completion of the treatment cycle is unlikely. Credit or refund will be given for services that were not performed.

### III. TREATMENT CYCLE

#### A. Ovarian Stimulation (Standard Protocol)

Medications used to supraovulate the ovaries may be given in a variety of combinations called *protocols*. Your physician will review your records and determine which protocol will be used for your upcoming cycle. The following information describes the initial protocol used for the majority of patients. In a standard protocol, there are three key steps.

##### 1. Down Regulation With Lupron

In order to optimize the stimulation of your ovaries, Lupron, is given starting approximately 1 week before your expected period (day 21 of a 28 day cycle). Alternately, if you have been instructed to initiate oral contraceptive pills (OCPs), then Lupron is started around day 15 (out of the 21 days of active pills) of the OCPs. Lupron suppresses both the pituitary gland and ovaries and allows for greater pharmacologic ovarian stimulation. Lupron is administered subcutaneously (underneath the skin, not into the muscle). This medicine is typically injected into the thigh and is easily self-administered. Alternately, you may have your husband or a friend administer this medication. This medicine is usually given for at least 10 days before ovarian suppression occurs, but may also be given longer (for several months) without affecting your ovarian stimulation. Usually the Lupron dose will be reduced (1/2 dose) once the stimulation phase of the cycle begins.

##### 2. Ovarian Stimulation

You should experience a menstrual period within 7 to 14 days from starting the Lupron injections. Please notify the clinic when you start your period so that we may schedule a baseline sonogram and blood estradiol test. The purpose of these tests is to confirm that the Lupron has, in fact, suppressed your ovaries to a baseline state. This means that your ovaries should contain no follicles which are greater than 15 mm in size, and your blood estradiol level should be less than 50 pg/ml. In approximately 10-15% of patients, one or both of these conditions are not met and we will have you continue Lupron until further evaluation.

Occasionally a persistent ovarian cyst may need to be aspirated (office procedure). After ovarian suppression has been achieved, stimulation using gonadotropins will begin on a specified date (*cycle start*).

The initial dose of your medications will be based upon multiple factors (age, weight, FSH level, previous history) and be given subcutaneously once or twice a day. You will take this initial dose of medication for 2 days before returning for an estradiol blood test. Sonograms are performed starting on Day 7 of your stimulation. Further doses of gonadotropins may be modified based on estradiol levels or sonogram results. In general, you will return for follow-up sonograms and estradiol blood tests usually every 1 to 3 days in order to monitor follicular growth and endometrial development. Usually visits are more frequent at the end of a stimulation cycle. Most people require approximately 10 days of ovarian stimulation.

##### 3. Follicle Triggering (HCG)

When your follicles indicate that your eggs are mature, we will instruct you to take HCG. In general, at least two follicles with a mean diameter of at least 18 mm and an appropriate estradiol level must be present before HCG is administered. Also, at least 2 mature follicles should be present in order to receive HCG. You will be instructed to inject HCG 36 hours before the oocyte retrieval. For example, we may tell you "trigger" at 7:00 p.m. Monday evening, so that oocyte retrieval can occur at 7:00 a.m. Wednesday morning. This will be your last injection prior to the egg retrieval.

**Timing of this medication is extremely important!**

## B. Oocyte (Egg) Retrieval

You should have nothing to eat or drink in the eight hours prior to your retrieval. The egg retrieval will be performed on the 1<sup>st</sup> floor of the Margot Perot building at the Presbyterian Hospital campus of Dallas. The procedure is conducted under intravenous sedation, administered by an anesthesiologist, so that you will be comfortable during the egg collection. Most patients are candidates for vaginal ultrasound retrieval. This procedure involves the use of a vaginal sonogram to guide a needle through the posterior wall of the vagina into an ovary. Each follicle is then aspirated under direct visualization. The procedure usually last about 20 minutes. Patients are allowed to go home after a 1 to 2 hour recovery. Someone will need to drive you home following this procedure. If you experience pain, bleeding (more that a period), temperature > 101 degrees, or other side effects following the procedure, please notify your physician as soon as possible.

## C. Collection of Semen Specimens

A semen specimen will be required on the day of egg retrieval, and is usually collected at the ARTS center. Abstinence from intercourse is required for approximately 2 days prior to egg retrieval. We recommend that ejaculation occurs the same evening when HCG is given to assure better quality sperm for the IVF procedure. If a significant male factor is present, you may be asked to prolong the period of abstinence prior to the day of the oocyte retrieval. **If you anticipate any collection difficulties, please notify your physician.**

## D. Oocyte Culture

After the egg retrieval, you will be given the preliminary results on the number of oocytes retrieved. Please realize that the quality, number, and maturity of the eggs may not be evident because the eggs are surrounded by follicle cells (granulosa cells) which prevent quick evaluation. Supraovulation yields various types of eggs, including mature, immature, post mature, and nonviable eggs.

You will be contacted by an embryologist one day after your egg retrieval and given the status report on the number of oocytes that fertilize. At this time, fertilization is seen in most cases, but viability can only be confirmed when the fertilized egg divides normally, usually after another day. As you know, one risk of IVF is lack of fertilization. Sometimes a reason for this is understood, but many times no reasons are evident.

## E. Embryo Transfer

We will ask you to arrive 30 minutes prior to your scheduled embryo transfer time. Husbands are encouraged to be present. The procedure is similar to having an intrauterine insemination. Sedation and pain medications are usually not necessary. Usually this procedure will be done under (transabdominal) ultrasound guidance. You will rest on your back at the ARTS Center for approximately thirty minutes. You should have someone with you to drive you home after embryo replacement.

## F. Luteal Phase Support

On the day *after* your oocyte retrieval, you will be instructed to start progesterone injections. Progesterone is a hormone produced by the ovaries only during the post-ovulation, or luteal phase, of your ovarian cycle. Progesterone develops the endometrial lining of your uterus to support and maintain pregnancy. Although your ovaries are producing progesterone, supplementation is required because some of the cells which produce progesterone in the ovary are removed during the egg retrieval, and some of the medications you received may contribute to a progesterone deficiency after the oocyte retrieval.