

**AMERICAN SOCIETY FOR REPRODUCTIVE MEDICINE**

# AGE AND FERTILITY

*A Guide for Patients*



**PATIENT INFORMATION SERIES**

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# AGE AND FERTILITY

## *A Guide for Patients*

*A glossary of italicized words is located at the end of this booklet.*

### INTRODUCTION

In today's society, age-related *infertility* is becoming more common. Approximately 20% of women wait until after age 35 to begin their families. Several factors have contributed to this trend: 1) contraception is readily available; 2) more women are in the work force; 3) women are marrying at an older age; 4) the divorce rate remains high; 5) married couples are delaying pregnancy until they are more financially secure; and 6) many women don't realize that their fertility begins to decline in their late 20s or early 30s.

In addition, stories in the media may lead you to believe that you can delay getting pregnant and then use assisted reproductive technologies (ART) to get pregnant when you're ready. However, age affects the success rates of infertility treatments as well as your natural ability to get pregnant. For example, if you are a healthy 30-year-old woman, you have about a 20% chance per month to get pregnant. By age 40, however, your chance is only about 5% per month. In many cases, these percentages are true for natural conception as well as conception using ART.

It is important to remember that your fertility decreases with age, particularly after age 35 (Table 1). Even though women today are healthier and taking better care of themselves than ever before, improved health in later life does not offset the natural age-related decline in fertility.

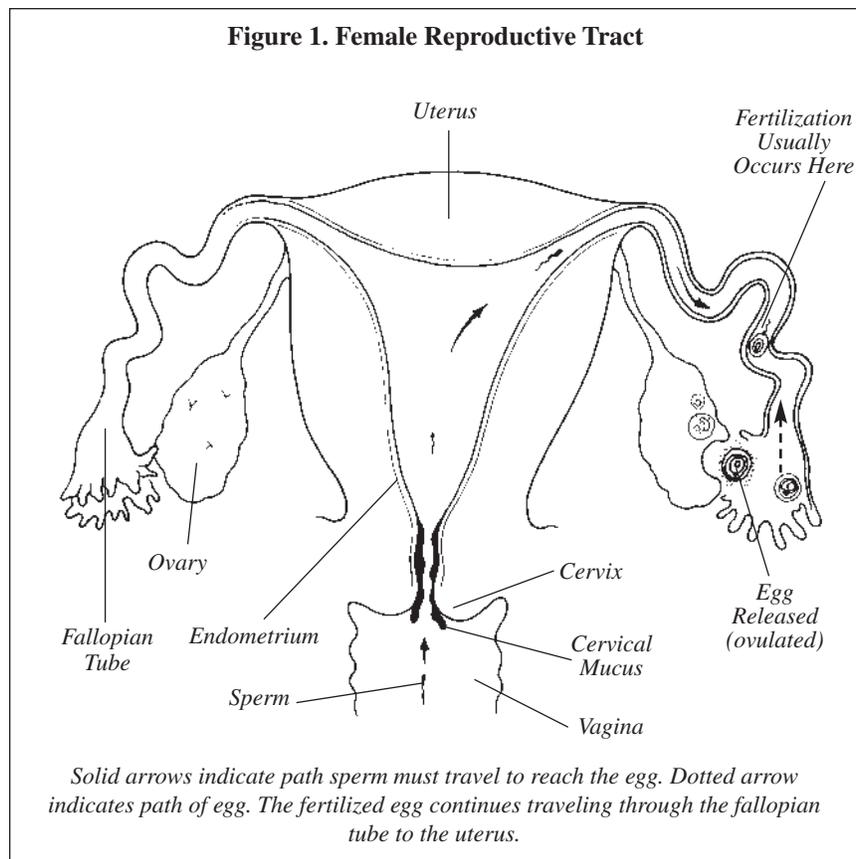
<i>Age Group (years)</i>	<i>Percent Infertile</i>	<i>Percent chance of remaining childless*</i>
20 - 24	7	6
25 - 29	9	9
30 - 34	15	15
35 - 39	22	30
40 - 44	29	64

Adapted from Menken J, Trussell J, Larsen U. Age and infertility. *Science*. 1986;23:1389.  
\* Historical data based upon the age at which a woman marries.

## OVARIAN FUNCTION

As you age, your fertility declines due to normal, age-related changes that occur in your *ovaries*. You are born with all the *eggs* that you will ever have in your ovaries, unlike men who continue to produce sperm their entire lives. Even though you have over a million eggs in your ovaries at birth, you only have about 300,000 eggs left by the time you reach puberty. Of the eggs remaining at puberty, only about 300 will be ovulated during your entire reproductive years and the rest will undergo *atresia*. *Atresia* is a degenerative process that occurs regardless of whether you are pregnant, have normal menstrual cycles, use birth control, or are undergoing infertility treatment. Smoking appears to accelerate *atresia* and is linked to earlier *menopause*.

During your reproductive years, your ovaries ovulate (release) an egg each month (Figure 1). If the egg is fertilized and implants in the lining of your uterus (endometrium), you become pregnant. If you do not become pregnant, the endometrial lining that thickened with blood in preparation for a pregnancy is shed in the form of the menstrual flow, and the cycle begins again.



## ***The Menstrual Cycle***

The menstrual cycle is divided into three phases: the follicular phase, the ovulatory phase, and the luteal phase.

### ***The Follicular Phase***

The follicular phase lasts about 10 to 14 days, beginning with the first day of menstruation and lasting until the *LH surge*. During the follicular phase, the *hypothalamus*, which is an area of your brain, releases *gonadotropin releasing hormone (GnRH)*. This hormone tells the pituitary gland, located at the base of your brain, to release *follicle stimulating hormone (FSH)*. FSH stimulates, or triggers, the development of several *follicles* in your ovaries. These follicles contain immature eggs. One of these follicles will become the dominant follicle and its egg will begin to mature. The other follicles that were stimulated stop developing, and their eggs undergo atresia. The dominant follicle increases in size and secretes, or sends out, estrogen into the bloodstream. The rising levels of estrogen cause the hypothalamus and pituitary to slow down the production of FSH.

### ***The Ovulatory Phase***

The ovulatory phase begins with the LH surge and ends with ovulation, which is the release of the egg from the dominant follicle. As ovulation approaches, estrogen levels rise and trigger the pituitary gland to release a large surge of luteinizing hormone (LH). About 16 to 32 hours after this LH surge, the dominant follicle releases (ovulates) its egg.

### ***The Luteal Phase***

The luteal phase begins after ovulation and generally lasts about 14 days. After the egg is ovulated, the empty follicle that contained the egg closes and becomes known as the *corpus luteum*. The corpus luteum secretes large amounts of *progesterone*, a hormone that helps prepare the endometrium for *embryo* implantation (pregnancy). If the egg is fertilized by a sperm, the resulting embryo reaches the *uterus* several days later and begins to implant in the endometrium. If an embryo does not implant, progesterone levels decline. The endometrium then breaks down, which results in menstruation, and the cycle begins again.

Even though your cycles may continue to be regular in your 30s and 40s, the eggs that ovulate each month will be of poorer quality than those from your 20s. During this time in your life, your physician may wish to evaluate your *ovarian reserve*, which will help you understand your potential ability to get pregnant based on the quality of eggs remaining in your ovaries.

## ***Ovarian Reserve***

Ovarian reserve refers to your fertility potential in the absence of any problems in your reproductive tract (fallopian tubes, uterus, vagina). It mainly depends on the number and quality of eggs in your ovaries and how well the ovarian follicles are responding to the hormonal signals from your brain.

As you approach menopause, your ovaries begin to respond poorly to FSH and LH. As a result, your body produces more of these hormones in an attempt to “jump start” egg development in your ovaries. When your ovaries stop responding to FSH and LH, your menstrual cycles become shorter. Eventually your ovaries may not release an egg each month and you will skip a period. By the time you reach menopause, at about age 51, you’ll have few or no eggs left in your ovaries.

Several tests are available to evaluate your ovarian reserve. Your doctor may recommend measuring your blood levels of FSH on the second, third, or fourth day of your menstrual cycle. High levels of FSH indicate that your ovarian reserve is low, and that your chances of conception are poor. However, normal levels of FSH may not indicate that you have a good chance of conception. Your age is the most important predictor of your potential to get pregnant. Other tests of ovarian reserve include the *clomiphene citrate challenge test (CCCT)*, circulating *inhibin B* levels, and *ultrasound* assessment of follicle numbers.

Diminished ovarian reserve is usually age related and occurs due to the natural loss of eggs and decrease in the average quality of the eggs that remain. However, young women may have reduced ovarian reserve due to smoking, family history of premature menopause, prior ovarian surgery, and even if they have no known risk factors.

## ***Genetic Abnormalities***

As you age, the eggs in your ovaries also age and are more likely to have genetic abnormalities. For example, chromosomal disorders such as *Down syndrome* are more common in children born to older women (Table 2).

**Table 2. Risk of Chromosomal Abnormality in Newborns by Maternal Age**

<i>Maternal Age (years)</i>	<i>Risk for Down Syndrome</i>	<i>Total Risk for Chromosomal Abnormalities</i>
20	1/1,667	1/526
25	1/1,250	1/476
30	1/952	1/385
35	1/378	1/192
40	1/106	1/66
41	1/82	1/53
42	1/63	1/42
43	1/49	1/33
44	1/38	1/26
45	1/30	1/21
46	1/23	1/16
47	1/18	1/13
48	1/14	1/10
49	1/11	1/8

Source: *Maternal Fetal Medicine: Practice and Principles*. Creasy and Resnick, eds. W.B. Saunders, Philadelphia, PA. 1994:71. Reproduced with permission.

In addition, when eggs from older women are fertilized, the embryos are less likely to develop. For this reason, women who are over 40 are at increased risk for *miscarriage* (Table 3).

**Table 3. Risk of Miscarriage (Spontaneous Abortion) with Increased Age**

<i>Maternal Age (years)</i>	<i>Spontaneous Abortion (%)</i>
15-19	10
20-24	10
25-29	10
30-34	12
35-39	18
40-44	34
≥45	53

Adapted from P.R. Gindoff and R. Jewelewicz. Reproductive potential in the older woman. *Fertility and Sterility*. 46:989;1986.

## OTHER FACTORS AFFECTING FERTILITY

Age is not the only factor that affects fertility. Problems with your partner or any gynecologic or medical problems may affect your chances of conception.

### *Gynecological Conditions*

There are other medical conditions, such as uterine fibroids and *endometriosis*, that may progress with age and affect your fertility. Exposure to sexually transmitted diseases can also affect your fertility. For more information, refer to the ASRM patient information booklets titled *Uterine Fibroids*, *Endometriosis*, and *Infertility: An Overview*.

### *Fertility in the Aging Male*

Though not as abrupt or noticeable as menopause in women, changes in fertility and sexual functioning do occur in men as they grow older. Despite these changes, there is no maximum age at which a man cannot father a child, as evidenced by men in their 60s and 70s conceiving with younger partners.

As men age, their *testes* tend to get smaller and softer, and sperm *morphology* (shape) and *motility* (movement) tend to decline. In addition, there is a slightly higher risk of gene defects in their sperm. Aging men may develop medical illnesses that adversely affect their sexual and reproductive function. Not all men experience significant changes in reproductive or sexual functioning as they age, especially men who maintain good health over the years. If a man does have problems with *libido* or erections, he should seek treatment through his primary

care physician and/or urologist. Decreased libido may be related to low levels of *testosterone*.

## INFERTILITY EVALUATION

Infertility is usually diagnosed if you don't conceive after one year of unprotected intercourse. If you are 35 or older however, you should initiate your evaluation as soon as possible. If you are concerned about fertility or have an obvious medical problem affecting your ability to conceive, such as *amenorrhea*, sexual dysfunction, a history of pelvic disease, or prior surgery, you should begin the infertility evaluation immediately. You will have various tests which may include ovulation detection and evaluation of your fallopian tubes, cervix, and uterus. Your partner will have a *semen analysis*. Most testing can be completed within three months, and appropriate treatment can be started immediately after the evaluation is completed.

If you have a medical disorder such as high blood pressure or diabetes, you may wish to talk with your physician before attempting pregnancy. It is important that your health problems are under control. Your physician may suggest a change in medication or general health care before you attempt pregnancy. Even if you don't have high blood pressure or diabetes, these conditions develop more commonly in women who conceive after age 35. Special monitoring and testing may be recommended during pregnancy.

Preconception counseling is often beneficial as well. Because children born to women over 35 have a higher risk of chromosomal problems, you may wish to discuss these risks with your physician or a genetic counselor prior to attempting pregnancy. Prenatal testing may be performed after conception. *Amniocentesis* and *chorionic villus sampling* are two methods of prenatal testing. Blood testing and *ultrasound* may also be used as screening tests for certain birth defects. Many parents want to know as much about the pregnancy as possible so they can make informed decisions.

## TREATMENT OPTIONS AND ALTERNATIVES

Once testing is completed, your physician will discuss treatment options with you. Modern infertility therapy allows women many options. However, these treatments may have significant financial, emotional, and social consequences. Some couples decide that the best option is not to undergo infertility treatment but to consider alternatives such as adoption or child-free living.

### *Assisted Reproductive Technologies*

If a cause for infertility is identified, your physician may suggest a specific treatment. However, sometimes no specific problem is identified, and the infertility is unexplained. With unexplained infertility, or when traditional treatments have failed, advanced infertility therapies such as *superovulation with*

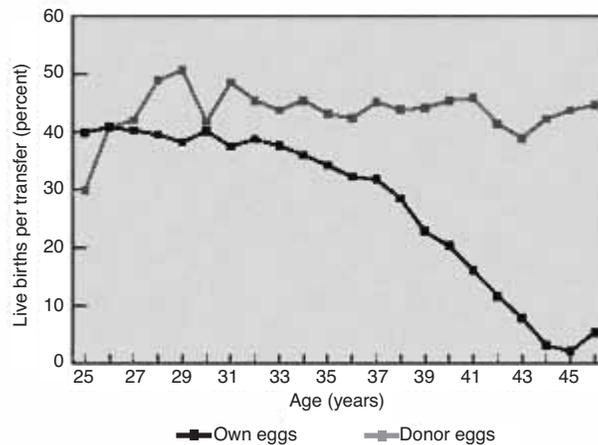
*timed intrauterine insemination (SO/IUI) or in vitro fertilization (IVF)* may be suggested. In an SO/IUI cycle, you receive fertility medications to initiate the growth of multiple eggs in your ovaries. When these eggs are ready to ovulate, your physician places your partner's sperm directly into your uterus. IVF involves removing your eggs and fertilizing them with your partner's sperm in the lab, and then transferring the resulting embryos to your uterus. Either procedure, as well as any infertility treatment, may be used with *donor sperm* rather than sperm from your partner.

As with any treatment, age affects your chance for pregnancy. In women over 40, the success rate of SO/IUI is generally less than 5% per cycle. This compares to success rates around 10% for women aged 35 to 40. IVF is more effective but also has relatively low success rates in women 40 and older, generally less than 15% per cycle. Ask your physician to discuss the success rates of any recommended therapy and how many treatment cycles are recommended. For more information on assisted reproductive technologies, refer to the ASRM patient information booklet titled *Assisted Reproductive Technologies*.

### **Egg Donation**

If you are older, especially if you're over 40, and have not succeeded with other therapies, or if you have *premature ovarian failure (POF)*, also known as *early menopause*, your treatment options are limited. One option is *egg donation*, which involves the use of eggs donated by another woman who is typically in her 20s or early 30s. If you are over 40, eggs from a younger woman are more likely to result in pregnancy and are less likely to end in miscarriage. Your chance of pregnancy is much higher in IVF cycles using donor eggs. The high success rate with egg donation confirms that egg quality is the primary barrier to pregnancy in older women (Figure 2).

**Figure 2. Percentage of Live Births per Transfer for Fresh Embryos From Own and Donor Eggs, by Age of Recipient, 2000**



Source: 2000 Assisted Reproductive Technology Success Rates, National Summary and Fertility Clinic Reports. [www.cdc.gov/nccdphp/drh/art.htm](http://www.cdc.gov/nccdphp/drh/art.htm)

In an egg donation cycle, the donor receives fertility medications to stimulate the production of multiple eggs in her ovaries. At the same time, you are given hormone therapy to prepare your uterus to receive the fertilized eggs (embryos). After the eggs are obtained from the donor, they are fertilized in the laboratory with your partner's sperm. Several days after *fertilization*, the embryos are transferred to your uterus. Any embryos which are not transferred may be frozen (cryopreserved) for a future cycle.

If you decide to pursue donor egg IVF, you may use a known donor, such as a friend or relative, or an anonymous donor. You may wish to choose a donor whose physical characteristics are similar to yours.

Donor egg IVF will offer you an opportunity to experience pregnancy, birth, and motherhood. The child, however, will be not be genetically related to you but will be related to the father and the egg donor. Many programs recommend counseling so that all parties in a donor egg agreement understand the ethical, legal, psychological, and social issues involved.

There are many facts you should consider prior to selecting a donor egg program. You will want to know how the donors are recruited, what screening is required, and what information you will receive about the donor. The average cost of a treatment cycle and the success rate of the program (the percentage of ongoing pregnancies or children born for each cycle started) are other important factors to consider. Because success depends heavily upon the quality of eggs that are donated, women in their 20s with proven fertility are ideal donors.

Often programs have more women requesting donor eggs than they have available donors. For this reason, the wait for a donor may be long. If you decide to use a known donor, such as a relative or friend, you should be sure that everyone involved is thoroughly informed about the treatments that will be required. Using a known donor raises special issues about parenting that must be discussed. All parties must understand how this will impact your families and what you will tell the child. Counseling can help you explore these issues. Also, all parties may consider consulting an attorney knowledgeable in third party reproduction before proceeding with egg donation.

### ***Surrogacy/Gestational Carrier***

If you do not have any eggs or your eggs are not of sufficient quality to produce a pregnancy, *surrogacy* can give you and your partner the option of having a child that is related to your partner. A *surrogate* is a woman who agrees to become pregnant using your partner's sperm and her own egg. The child will be genetically related to the surrogate and your partner, and the surrogate will give you and your partner the baby at birth.

A *gestational carrier* is an option for women who have had a hysterectomy but still retain their ovaries, or for women who should not become pregnant due to medical reasons. If you use a gestational carrier, your eggs are fertilized by your partner's sperm and the resulting embryos placed in the uterus of the

carrier. You and your partner will be genetically related to the child, but the carrier will not. She will give the baby to you and your partner at birth.

The surrogate or carrier should be carefully screened psychologically, medically, and legally. You and your partner may also wish to receive counseling. Surrogacy and gestational carrier arrangements are controversial options and laws vary from state to state. For more information, refer to the ASRM patient information booklet titled *Third Party Reproduction*.

### ***Foster Care and/or Adoption***

If you decide not to pursue infertility treatments, or if the treatments fail, you may wish to consider foster care and/or adoption as options for having a family. Foster care allows you to nurture a child without making a lifetime commitment and can help you decide if adoption is right for you. Government social service agencies often need couples or individuals who want to become foster or adoptive parents. Government and private adoption agencies are now more receptive to older couples and singles. In international adoptions, some countries even prefer older parents. If you decide to pursue foster care or adoption, you may still need to grieve your inability to have biological children. For more information, refer to the ASRM patient information booklet and patient fact sheet titled *Adoption*.

### ***Childfree Living***

Some couples may decide that living without children is preferable to infertility treatment or adoption. This is a personal decision that can only be made by you and your partner.

## **COUNSELING AND SUPPORT GROUPS**

Infertility at any age is a stressful experience, and counseling or support groups can be helpful. The intrusive nature of infertility testing and treatment can make you feel stressed or out of control. Feelings of sadness, anger, blame, guilt, depression, and loss are normal and can be overwhelming at times. Discussing your concerns with your partner, medical staff, and supportive people in your life is important. It may be helpful to join a support group or see a therapist. Ask your physician for the names of therapists with an interest in infertility or contact the Mental Health Professional Group of the American Society for Reproductive Medicine. For more information on the psychological aspects of infertility, refer to the ASRM patient information booklet titled *Infertility: Coping and Decision Making*.

## **SUMMARY**

Your fertility naturally declines as you get older. When this decline begins, however, and the rate at which it progresses vary widely in women. Generally,

fertility begins to drop in your late 20s or early 30s and falls more rapidly after the age of 35. If you decide to attempt pregnancy after age 35, it is important that you obtain information on appropriate testing and treatment while remaining realistic about your chances for success with infertility therapy. By learning about all of the options and being aware of your own needs and goals, you and your partner will be prepared to make the best decisions for you both.

### **Let Us Know What You Think**

Email your comments on this booklet to [asrm@asrm.org](mailto:asrm@asrm.org). In the subject line, type "Attention: Patient Education Committee."

## GLOSSARY

***Amenorrhea.*** The complete absence or suppression of menstrual periods.

***American Society for Reproductive Medicine (ASRM).*** A nonprofit, professional medical organization of more than 9,000 health care specialists interested in reproductive medicine. Contact info: American Society for Reproductive Medicine, 1209 Montgomery Highway, Birmingham, AL 35216; (205) 978-5000; asrm@asrm.org; www.asrm.org.

***Amniocentesis.*** A procedure in which a small amount of amniotic fluid is removed through a needle from the fetal sac at about 16 weeks into a pregnancy. The fluid is studied for chromosomal abnormalities which may affect fetal development.

***Atresia*** (ovarian). The natural process by which eggs age and degenerate.

***Cervix.*** The lower narrow end of the uterus that connects the uterine cavity to the vagina.

***Chorionic villus sampling.*** A procedure in which a small sample of cells is taken from the placenta early in a pregnancy for chromosomal testing.

***Chromosomes.*** Rod-shaped structures located in the nucleus of a cell which contain hereditary (genetic) material. Humans have 23 pairs of chromosomes (46 total). Two of the 46 are the sex chromosomes, which are the X and Y chromosomes. Normally, females have two X chromosomes and males have one X and one Y chromosome.

***Clomiphene citrate challenge test (CCCT).*** A test of ovarian reserve in which serum FSH is checked on days three and 10 of the menstrual cycle and clomiphene citrate is taken on days five through nine.

***Corpus Luteum.*** Literally, a “yellow body.” A mass of yellow tissue formed in the ovary from a mature follicle that has collapsed after releasing its egg at ovulation. The corpus luteum secretes estrogen and large quantities of progesterone, a hormone that prepares the lining of the uterus (endometrium) to support a pregnancy.

***Cryopreserved.*** Frozen. Sperm or embryos may be frozen and stored for future use.

***Donor egg.*** An egg from a fertile woman that is donated to an infertile woman to be used in an assisted reproductive technology procedure such as IVF. The woman receiving the egg will not be biologically related to the child but will be the birth mother on record.

***Donor sperm.*** The sperm donated by a fertile man who is not the recipient’s partner.

***Down syndrome.*** A genetic disorder caused by the presence of an extra chromosome 21 and characterized by mental retardation, abnormal facial features, and medical problems such as heart defects.

***Early menopause.*** Also called premature ovarian failure. Cessation of menstrual periods due to failure of the ovaries before age 40.

***Eggs.*** Also called oocytes or ova. The female sex cells produced by the ovaries,

which, when fertilized by a male's sperm, produce embryos, the early form of human life.

**Egg donation.** The process of fertilizing eggs from a donor and transferring the resulting embryos to the recipient's uterus. The recipient will not be biologically related to the child, although she will be the birth mother on record.

**Embryo.** The earliest stage of human development after a sperm fertilizes an egg.

**Endometriosis.** A condition in which endometrial tissue, which normally lines the uterus, develops outside of the uterine cavity in abnormal locations such as the ovaries, fallopian tubes, and abdominal cavity.

**Estradiol.** The predominant estrogen (hormone) produced by the follicular cells of the ovary.

**Estrogen.** The female sex hormones produced by the ovaries responsible for the development of female sex characteristics. Estrogen is largely responsible for stimulating the uterine lining to thicken during the first half of the menstrual cycle in preparation for ovulation and possible pregnancy. Estradiol and estrone are the main two estrogens.

**Fertilization.** The fusion of sperm and egg.

**Follicle.** A fluid-filled sac located just beneath the surface of the ovary, containing an egg (oocyte) and cells that produce hormones. The sac increases in size and volume during the first half of the menstrual cycle and at ovulation, the follicle matures and ruptures, releasing the egg. As the follicle matures, it can be visualized by ultrasound.

**Follicle Stimulating Hormone (FSH).** In women, FSH is the pituitary hormone responsible for stimulating follicular cells in the ovary to grow, stimulating egg development and the production of the female hormone estrogen. In the male, FSH is the pituitary hormone which travels through the bloodstream to the testes and helps stimulate them to manufacture sperm. FSH can also be given as a medication. The U.S. trade names are Fertinex™, Follistim™, and Gonal-F®.

**Genetic.** Referring to inherited conditions, usually due to the genes located on the chromosomes.

**Gestational Carrier.** A woman who agrees to have a couple's fertilized egg (embryo) implanted in her uterus. The gestational carrier carries the pregnancy for the couple, who usually has to adopt the child. The carrier does not provide the egg and is therefore not biologically (genetically) related to the child.

**Gonadotropin Releasing Hormone (GnRH).** The natural hormone secreted by the hypothalamus that prompts the pituitary gland to release follicle stimulating hormone (FSH) and luteinizing hormone (LH) into the bloodstream. This in turn stimulates the ovaries to produce estrogen, progesterone, and to ovulate. Factrel® and Lutrepulse® are brand names.

**Hormone.** A substance secreted from organs of the body, such as the pituitary gland, adrenal gland, or ovaries, which is carried by a bodily fluid such as blood to other organs or tissues where it exerts a specific action.

**Hypothalamus.** A thumb-sized area in the brain that controls many functions of the body, regulates the pituitary gland, and releases gonadotropin releasing hormone (GnRH).

**In vitro fertilization (IVF).** A method of assisted reproduction that involves combining an egg with sperm in a laboratory dish. If the egg fertilizes and begins cell division, the resulting embryo is transferred into the woman's uterus where it will hopefully implant in the uterine lining and further develop. IVF bypasses the fallopian tubes and is usually the treatment choice for women who have badly damaged or absent tubes.

**Infertility.** Infertility is the result of a disease (an interruption, cessation, or disorder of body functions, systems, or organs) of the male or female reproductive tract which prevents the conception of a child or the ability to carry a pregnancy to delivery. The duration of unprotected intercourse with failure to conceive should be about 12 months before an infertility evaluation is undertaken, unless medical history, age, or physical findings dictate earlier evaluation and treatment.

**Inhibin.** A substance produced by granulosa cells in the ovaries in females and the testes in males. It signals the pituitary gland to slow down the release of follicle stimulating hormone (FSH).

**Insemination.** Placement of sperm via a syringe into a female's uterus or cervix for the purpose of producing a pregnancy.

**Libido.** Sexual drive and desire.

**Luteinizing hormone (LH).** In women, the pituitary hormone that triggers ovulation and stimulates the corpus luteum of the ovary to secrete progesterone and androgens during the second half of the menstrual cycle.

**LH surge.** The secretion, or surge, of large amounts of luteinizing hormone (LH) by the pituitary gland. This surge is the stimulus for ovulation to occur.

**Menopause.** Natural cessation of ovarian function and menstruation. Menopause can occur between the ages of 42 and 56 but usually occurs around the age of 51, when the ovaries stop producing eggs and estrogen levels decline.

**Miscarriage.** The naturally occurring expulsion of a nonviable fetus and placenta from the uterus; also known as spontaneous abortion or pregnancy loss.

**Morphology.** The form, structure, and shape of sperm. At least 30% of the sperm in a semen sample should have oval heads and slightly curving tails.

**Motility.** The percentage of all moving sperm in a semen sample. Normally 50% or more are moving rapidly.

**Ovarian reserve.** A woman's fertility potential in the absence of specific pathophysiologic changes in her reproductive system. Diminished ovarian reserve is associated with depletion in the number of eggs and worsening of oocyte quality.

**Ovaries.** The two female sex glands in the pelvis, located one on each side of the uterus. The ovaries produce eggs and hormones including estrogen, progesterone, and androgens.

**Ovulation.** The release of a mature egg from its developing follicle in the outer layer of the ovary. This usually occurs approximately 14 days preceding the next menstrual period (the 14<sup>th</sup> day of a 28-day cycle).

**Pituitary gland.** A small hormone-producing gland just beneath the hypothalamus in the brain which controls the ovaries, thyroid, and adrenal glands. Ovarian function is controlled through the secretion of follicle stimulating hormone (FSH) and luteinizing hormone (LH). Disorders of this gland may lead to irregular or absent ovulation in the female and abnormal sperm production in the male.

**Premature ovarian failure.** Cessation of menstrual periods due to failure of the ovaries before age 40. Also known as early menopause.

**Progesterone.** A female hormone secreted by the corpus luteum after ovulation during the second half of the menstrual cycle (luteal phase). It prepares the lining of the uterus (endometrium) for implantation of a fertilized egg and allows for complete shedding of the endometrium at the time of menstruation. In the event of pregnancy, the progesterone level remains stable beginning a week or so after conception.

**Semen analysis.** The microscopic examination of semen (the male ejaculate) to determine its volume, the number of sperm (*sperm count*), their shapes (morphology), and their ability to move (motility) in addition to other parameters.

**Sperm.** The male reproductive cells produced by the testes that fertilize a woman's egg. The sperm head carries genetic material (chromosomes), the midpiece produces energy for movement, and the long, thin tail wiggles to propel the sperm.

**Superovulation with timed intrauterine insemination (SO/TUI).** A procedure to facilitate fertilization. The woman is given ovulation inducing drugs which cause her ovaries to produce multiple eggs. When the eggs are ready to be released, the woman is inseminated with her partner's sperm or donated sperm.

**Surrogacy.** An arrangement in which a woman is inseminated with the sperm of a man who is not her partner in order to conceive and carry a child to be reared by the biologic (genetic) father and his partner. The surrogate is genetically related to the child. The biologic father and his partner usually must adopt the child after its birth.

**Surrogate.** A woman who is inseminated with the sperm of a man who is not her partner in order to conceive and carry a child to be reared by the biological (genetic) father and his partner. The surrogate is genetically related to the child.

**Testes.** The two male reproductive glands located in the scrotum which produce testosterone and sperm.

**Testosterone.** In men, the primary male hormone produced by the testes. It is responsible for the development of sperm, male physical characteristics, and sex drive. Testosterone is also produced in small quantities by the ovaries in women.

**Ultrasound.** A picture of internal organs produced by high frequency sound

waves viewed as an image on a video screen; used to monitor growth of ovarian follicles or a fetus and to retrieve eggs. Ultrasound can be performed either abdominally or vaginally.

***Uterus (Womb).*** The hollow, muscular organ in the pelvis where an embryo implants and grows during pregnancy. The lining of the uterus, called the endometrium, produces the monthly menstrual blood flow when there is no pregnancy.

## NOTES

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