



FERTILITY CENTER

*Pathway to Parenthood*

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## WHAT ARE THE INDICATIONS FOR IN VITRO FERTILIZATION (IVF)?

**Male Infertility:** IVF is the treatment of choice for moderate or severe male infertility. Treatments such as Intrauterine Insemination (IUI) and Gamete Intrafallopian Tube Transfer (GIFT) are relatively non-efficacious when it comes to treating moderate and severe cases of male infertility (bulk parameters less than ~10 million/cc). Although always a treatment of choice for male infertility, it was not until the relatively recent introduction of Intracytoplasmic Sperm Injection (ICSI) in the 1990's, that IVF has become just as successful when applied in cases of extremely severe male infertility as for female related causes. ICSI is a procedure where fertilization is achieved through the direct injection of one sperm into each egg. We have been involved in the care of a couple where the male had less sperm in his ejaculate than his wife produced eggs. They successfully conceived on two separate occasions. In cases where sperm have to be surgically extracted by TESE (Testicular Sperm Extraction), counts obtained are very low, yet ICSI remains a very useful procedure.

**Tubal / Pelvic Inflammatory Disease (PID) and/or Adhesions:** In the early 90's IVF birthrates began to improve to the point that tubal surgery for the treatment of infertility due to damaged or blocked fallopian tubes rapidly became obsolete. Sadly, and adding to the plight of many patients, there are still some physicians with a die-hard attitude who still recommend or perform tubal surgery for infertility due to tubal disease resulting from PID. This in spite of the fact that IVF performed in an optimum setting, offers more than double the birth rate following a single month of treatment than can be achieved within two to three years following surgery.

**Endometriosis:** Endometriosis is the presence of endometrial tissue in abnormal locations. As such the body establishes an inflammatory reaction in an effort to attempt to rid the area of these focal lesions. The end result of this reaction is often scar tissue formation, which in and of itself can cause anatomical distortions, and negatively impact successful reproduction. Even in milder cases of endometriosis there can be an associated presence of "toxins" in the pelvic secretions that surround the fallopian tubes (where the sperm await the egg to fertilize it). Regardless of whether fertility drugs are used, or whether IUI is performed, the egg(s) will inevitably become exposed to "toxic" pelvic secretions as they enter the fallopian tube(s). Accordingly such options (IUI) are largely ineffective in the treatment of

endometriosis-related infertility. IVF therefore can be quite beneficial in patients with endometriosis, where eggs are extracted from the ovaries before they come in contact with pelvic secretions, by-pass this problem (as well as any anatomical distortions) and accordingly it represents the treatment of choice.

**Age-related Infertility:** Infertile women approaching the menopause need to be proactive. The birth rate (with own eggs) in IVF centers of excellence, for women between 40 and 43 years, is 15-20 % per cycle of treatment. Women who are unable to produce enough good quality eggs are better advised to consider IVF using an egg donor where the comparable birthrate per cycle can be expected to be above 50%, provided that the egg donor is under the age of 35 years.

**Unexplained Infertility:** When there is no apparent cause for infertility and the woman is over 35 years of age and/or has failed to respond to other types of treatment, IVF becomes the treatment of choice. IVF can by-pass the so-called “barriers to natural conception” by placing the sperm and eggs in direct contact with each other and the resulting embryo(s) directly into the uterine cavity.

**Immunologic Infertility:** Almost 40 percent of infertility, unrelated to a male factor, is associated with one or more immunologic problem that compromises implantation of the embryo, requiring extensive and often expensive immunotherapy. The extensive and expensive nature of immunotherapy often favors all most effective form of treatment, i.e. IVF, in such cases. The embryo is an extremely active biologic entity and will become immunologically “different” quite rapidly as different genes become activated. Therefore, for patients with a history of significant allergies (to dusts, pollens, asthma, psoriasis, eczema etc), it is prudent to move to IVF sooner than later with or without the addition of immune-modulation therapy.

**Recurrent Failure with Intrauterine Insemination (i.e.  $\geq 3$ ):** Intrauterine insemination (IUI), the injection of sperm into the uterus by means of a catheter introduced through the cervix, is based upon the premise that sperm can reach and fertilize the egg more easily if placed within the uterine cavity. IUI can be of great value, if used appropriately and selectively. It is most effective when performed in cases of infertility due to cervical mucus hostility (unrelated to antisperm antibodies), absent or dysfunctional ovulation, and unexplained infertility, provided that the woman is less than 40 years of age. It has little, if any, benefit in cases of moderate or severe male infertility, organic pelvic diseases, such as endometriosis (where the performance of IUI in ovulating women does not improve pregnancy rates over no treatment at all), and in cases of tubal disease (whether corrective surgery has been performed or not). With the exception of cervical mucus hostility (unrelated to female sperm antibodies) and artificial insemination of thawed sperm (husband or donor-related), there is no place for the performance of IUI during natural cycles. In young IUI candidates, clomiphene citrate (Serophene, Clomid) may be used for ovarian stimulation in preparation for IUI, but it should be recognized that birth rates are likely to be at least 30% lower when compared to the success rates following gonadotropin (Gonal-F, Follistim, Bravelle, etc.) stimulation. When appropriately indicated

and conducted in association with gonadotropins, IUI performed in women under 35 years is associated with an average birth rate of approximately 15% per cycle of treatment. The cumulative birth rate within three cycles of IUI performed in such cases is approximately 40%. For women over the age of 40, the IUI birth rate per cycle is less than 2%. Since such women are usually confronted with the consequences of a rapidly ticking “biological clock,” IVF with its associated significantly improved success rate, is far more preferable. When gonadotropins are administered for IUI (it is best for patients to avoid ovarian stimulation after each treated cycle (the resting cycle). If three IUI-gonadotropin stimulated cycles (i.e. over a period of at least 6 months) where ovulation was successfully induced does not result in a viable pregnancy, IVF becomes the subsequent treatment of choice.

**Genetic Diseases:** If a couple is known to have a predisposition to passing along a genetic disease, this can be avoided with use of IVF and preimplantation genetic diagnosis (PGD). In other words, if both the man and the woman are carriers of a certain genetic disease (e.g. cystic fibrosis, sickle cell anemia), then there is a 25% chance of having a child affected by these serious conditions. PGD is a technology that allows sampling the embryos’ genetic material to ensure that the embryo is not affected by that disease.

**Conclusion:** IVF is the single most efficacious treatment option for a wide variety of reproductive options. The processes, drugs and technologies have advanced dramatically over the past 25 years, therefore the list of indications will grow dramatically in the years ahead.

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*This handout is intended as an aid to provide patients with general information. As science is rapidly evolving, some new information may not be presented here. It is not intended to replace or define evaluation and treatment by a physician.*