Module

LTT_V3_US

Display

Introduction

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. Throughout this series, we'll guide you through the processes and procedures of various low tech fertility treatments. We'll provide you with in-depth information about the risks, benefits, and choices involved in your treatment program. Patients who understand the overall process tend to have a more positive experience as they progress through the cycle. We'll cover a lot of ground, so take your time and feel free to repeat videos if there's anything you don't understand. We hope that after you complete this module that you'll feel confident discussing any further concerns with your medical team. .

The Menstrual Cycle

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Before you begin fertility treatment it's helpful to understand the menstrual cycle. Learning about the similarities and differences between the two can help you feel more comfortable with how fertility treatment works. The menstrual cycle is regulated by a fascinating series of coordinated hormonal changes throughout the body. A part of the brain called the hypothalamus produces a hormone known as gonadotropin releasing hormone, or GnRH, which stimulates the pituitary gland. The pituitary gland then releases two Gonadotropin hormones: follicle stimulating hormone, or FSH, and Luteinizing hormone, LH. In the first half of the menstrual cycle, or follicular phase, the ovary is populated by small fluid-filled structures called follicles, which produce estrogen and contain an immature egg. FSH from the pituitary gland stimulates the growth of a single follicle in one ovary. This happens over about 14 days, causing the follicle to produce more estrogen, and the egg within that follicle to mature. The rising estrogen level causes the uterine lining, also known as the endometrium, to thicken in preparation for the eventual fertilized egg. Once the follicle is fully mature and the estrogen level high, production of LH rises sharply completing maturation of the egg and triggering ovulation. Ovulation is the release of an egg from the ovary into the fallopian tube, where sperm traveling through the reproductive tract can find the egg and fertilize it. The sperm must do so within about 24 hours of ovulation or the egg will degenerate and pregnancy will not occur.

The second half of the menstrual cycle, after ovulation, is known as the luteal phase. During this phase, what remains of the follicle develops into a hormone-producing structure known as the corpus luteum. In addition to continuing to produce estrogen, the corpus luteum also produces large amounts of progesterone, which matures and maintains the endometrium. If the egg is not fertilized, the corpus luteum will degenerate after about 14 days, at which point progesterone levels drop, the uterine lining sheds, and a new menstrual cycle begins.

However, if fertilization does occur, the fertilized egg, or embryo, enters the uterus from the fallopian tube after about 6 days, and may become embedded in the uterine lining. This is called implantation. As a result of implantation, cells in the outer layer of the embryo begin to produce a hormone called human chorionic gonadotropin, or hCG. hCG continually stimulates the corpus luteum to produce more progesterone, preventing the loss of the uterine lining. As you progress through this module, you will see that all of the hormones that are produced in a typical menstrual cycle are also used in fertility treatment, often in higher quantities to increase the number of eggs that may be produced in any one cycle, to improve your chances of successful treatment.

The Need for LowTech Fertility Treatments

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There are a number of issues that low-tech fertility treatments can address. One common reason to pursue treatment is that ovulation is not occurring properly. If ovulation is not occurring in a regular, timed fashion, even if you are experiencing menstrual cycles, it is likely that the pituitary gland and the ovaries are not communicating appropriately. Polycystic ovary syndrome, or PCOS is the most common ovulatory condition in which the fluctuation of hormones in the menstrual cycle does not occur. In a typical polycystic ovary, there will be multiple follicles that form like a pearl necklace on the periphery of the ovary. A less common cause for ovulatory dysfunction is hypothalamic amenorrhea . In patients with this condition, the hypothalamus is not communicating properly with the pituitary gland, and therefore the pituitary gland will not send the appropriate signals to the ovary to mature and release an egg. Ovulation could occur properly but other issues may prevent fertility. . These issues may range from a blocked fallopian tube, to mild male factor, to endometriosis. Sometimes, no specific cause can be identified and this is often referred to as “unexplained infertility”. For these conditions, medications may be prescribed to induce ovulation and/or stimulate the production of multiple eggs in a single cycle, increasing the odds of successfully fertilizing one and achieving pregnancy. There are also treatments that may be used in tandem with timed insemination or to address issues with the sperm. For example, A procedure known as intrauterine insemination, or IUI, can be used if there is low sperm count or motility, or when the cervical mucus may be a barrier to conception.. By synchronizing the timing with ovulation and placing more moving sperm into the uterus, fertilization of the egg and pregnancy are more likely to occur. In cases where there is no sperm, or there are issues with the sperm, donor sperm may also be used to help achieve a pregnancy. Your medical team will work with you to determine the best treatment, or combination of treatments, to achieve your fertility goals.. . . .

The Drugs and Protocols

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Your medical team will select the medication protocol that best addresses your unique situation. Clomiphene Citrate, commonly referred to as Clomid, or Letrozole, are oral medications that stimulate the hypothalamus and pituitary glands to produce more FSH and LH. These gonadotropins, in turn, stimulate the ovaries to mature and release eggs, and to produce the hormones estrogen and progesterone. A typical protocol may involve taking 1-3 clomid or letrozole tablets per day for 5 consecutive days, starting on day 3, 4, or 5 of the treatment cycle. . . . . Your provider may prescribe injectable hormones that include FSH, to stimulate the ovaries directly. FSH and LH administered by subcutaneous injections using a very small needle that is placed into the tissue under the skin. These medications are typically given daily starting on the third day of the treatment cycle until the follicles containing the eggs are fully developed. Your provider may adjust the starting day and dosage according to your age, ovarian function, weight, and previous response to treatment. . . . . Some protocols call for a combination of Clomid or letrozole and FSH. A typical combination protocol involves taking Clomid or letrozole each day

for cycle days three to seven, and then taking one or more injections of FSH in the following days. During treatment, your medical team will monitor your progress to ensure the medications are having the desired effect. Patients who use only Clomid or letrozole can sometimes monitor themselves for ovulation with urinary LH tests at home. More frequently, patients will come into a clinic for an ultrasound and blood hormone test to check the status of the ovaries and uterine lining, and to help predict the timing of ovulation. Your provider will use monitoring results to assess your response to treatment ~~treatment's success~~ and adjust your medication's dosage accordingly. . It can take as few as seven days and, in rare situations, more than 20 days to develop a viable ovulatory follicle. It’s important to note that in about 20% of cases, the cycle may need to be cancelled due to an inadequate or excessive response. Once the egg or eggs are ready, an injection of a hormone called hCG, or human

chorionic gonadotropin, may be given to trigger the release of your egg or eggs. hCG can be injected under the skin using a very small needle

or as an intramuscular injection in the gluteal muscle. . Your treatment may include a combination of these hormone medications .....or none at all and rely on your menstrual cycle. Ideally, your treatment will result in the ovulation of one or more viable eggs. In coordination with ovulation, fertilization can occur with timed intercourse or with Intrauterine Insemination. Exact timing of ovulation is not required, as eggs remain viable for about 24 hours and sperm remains viable for about 72 hours..

Treatment Risks and Side Effects from Fertility Drugs

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It is important to be aware of the controversy surrounding cancer risks that may be presented by injections of FSH as well as the oral medication, Clomid. In the 1990s, a few studies suggested that fertility drugs could result in an increased risk of breast, ovarian, or uterine cancer. Many later studies did not confirm this finding and recognized that the original studies didn't account for the fact that infertility itself is associated with an increased risk of cancer. Millions of people have gone through fertility treatment since these initial studies and there does not seem to be any increased risk of cancer due to fertility drugs. It's important that you carefully consider these studies in making your decision to undergo a fertility treatment cycle. Clomiphene citrate is usually very well tolerated, and side effects are fairly mild and infrequent. A small percentage of patients may experience dizziness and other visual symptoms, which are likely to go away on their own. If you experience these symptoms you can let your medical team know. ~~which may be serious and should be reported to your medical team~~. Letrozole, while not currently FDA approved for fertility treatment, is frequently used for **ovulation induction** and has several desirable features due to its **short lifespan** in the body

and **minimal side effects** compared to clomiphene citrate. Letrozole is also more likely to result in the development of a single follicle rather than multiple follicles, which can decrease the risk of multiple pregnancies. Both Clomiphene citrate and letrozole may cause symptoms usually associated with ovulation, such as mid-cycle ovulation pain, breast tenderness, and menstrual cramps. Injectable medications containing FSH are well tolerated, however, there are infrequent side effects, including fatigue, headaches, nausea, or mood swings. Temporary weight gain of between two and five pounds may also occur due to fluid retention. In some cases, ovarian stimulation can result in a condition known as OHSS, ovarian hyperstimulation syndrome.. Symptoms of OHSS include excessive swelling of the ovaries and buildup of fluid in the body. These symptoms cause moderate abdominal bloating and discomfort that generally resolve without medical treatment over three to seven days. OHSS is more likely, in IVF cycles where multiple follicles are recruited simultaneously. OHSS is less likely with ovulation induction because fewer follicles are stimulated.. Each risk, however small, should be evaluated thoroughly and all questions discussed with your medical team.. . .

Sperm Selection for IUI

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Sperm selection is important to increase the likelihood of fertilization and the development of a healthy embryo. ~~A sperm samples is placed in a test tube and spun in a centrifuge~~. Using a process called “sperm washing”, the most active sperm are separated from the rest of the semen sample,

which contains dead sperm, enzymes, proteins, and other fluids.. This concentrated sample of active sperm can then be ~~is then placed in a culture medium where it can be frozen, to be thawed later and~~ used for an IUI. For patients who experience infertility due to a complete lack of sperm, genetic disorder, or severe male factor, pregnancy can still be achieved with the use of donor sperm and IUI.. . Donor sperm can be obtained through a sperm bank, where donors are screened for psychological wellness, infectious diseases, and genetic health. Alternatively, you may choose to work with a known donor whose semen sample can be collected at a fertility center.. Once collected, the sperm is frozen and quarantined.. Infectious disease testing is performed again before the sperm is made available for use. After a patient chooses a suitable donor...

a frozen sample of the sperm is shipped to the facility for use during each treatment cycle. Success rates using these frozen samples of donor sperm

will vary depending on the age of the woman and any underlying fertility problems..

Intrauterine Insemination

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Intrauterine Insemination, or IUI, is one of the least invasive treatments for infertility. In an IUI procedure, concentrated sperm is inserted directly into the uterus. This procedure can be performed with or without additional fertility medications. When no fertility medications are used, this is known as a “natural cycle” IUI in which treatment is timed to align with a patients menstrual cycle. . . First, a speculum is inserted into the vagina to visualize the cervix. A soft, thin catheter is then placed through the cervix and into the uterus. The concentrated sperm sample is injected through the catheter and into the uterus. This procedure typically takes less than five minutes.

. . . . . The procedure is rarely painful, though you may feel some cramping as the catheter is inserted through the cervix. Occasionally, excessive curvature of the pathway through the cervix into the uterus makes insertion of the catheter difficult,

but a full bladder will often straighten the curvature. ~~In rare circumstances, an instrument called a tenaculum may be required to straighten the pathway, or ultrasound guidance may be used~~. Following the IUI, your medical team will provide you with instructions on what to do as you wait to take your pregnancy test. .

Success Rates Using Low Tech Treatments

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It's important to understand the success rates of low tech fertility treatments.. First, let's establish a baseline understanding of pregnancy rates. Unless you are experiencing infertility, your monthly chances of conceiving are determined by your age. If you are younger than 35, the chance of conceiving in any one cycle is 20-25%. Around age 35 there is a strong decline in pregnancy rates, and by age 40, the chance of conception is as high as 10% per cycle. . This age-related decrease is due primarily to a decline in the quality of the eggs within the ovaries. If you have been diagnosed with infertility, your likelihood of conceiving is typically well below this natural decline. Depending on your diagnosis, using low-tech fertility treatments, can help you achieve pregnancy at rates closer to those seen in patients of your same age who do not face any fertility issues. The likelihood that low-tech fertility treatments will result in a clinical pregnancy or live birth depends on many individual factors: your **diagnosis and age**, the **quality of sperm** being used, your **response to medications**, and the condition of your uterus ~~(**Uterus condition**)~~. It often takes more than one cycle of treatment to achieve a pregnancy. If there has not been a pregnancy after three or four cycles of low-tech treatment, you may consider more aggressive treatment such as IVF. . Because the chance of pregnancy through low-tech treatment over the age of 40 is low, and because fertility is declining rapidly at this age, providers may advise a move to IVF earlier in the treatment timeline. Conversely, success rates are higher than average among patients who have achieved pregnancies in previous IUI cycles,

making those patients generally good candidates for repeat IUI treatment. Whatever the course of treatment, the response of any individual patient cannot be predicted with certainty. It is important to discuss your particular circumstances and history with your physician in order to arrive at a reasonable understanding of your chances of pregnancy or birth following one or more treatment cycles. No matter how favorable the chances of pregnancy are, there are no guarantees.. .

Pregnancy Risks

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Regardless of the conception method,

all pregnancies are at risk for certain complications. Miscarriages occur in 10 to 30% of all pregnancies and increase significantly with age. Age, rather than the method of conception, impacts the likelihood of a genetic condition occurring, including Down syndrome. Singleton pregnancies conceived using low-tech treatments have no greater risk of **miscarriage, chromosomal issues, birth defects, gestational diabetes**, or **high blood pressure** than those conceived at home. However, low-tech treatments carry an increased risk of ectopic pregnancy, in which the embryo implants in the fallopian tube rather than the uterus. **Ectopic pregnancy** occurs in 2% of low-tech treatment conceptions, compared to the 1% frequency seen in conceptions without any treatment. Ectopic pregnancies are more common in cases with a previously identified tubal problem. The health of any baby is affected by

obstetric, genetic, environmental, and **chromosomal factors** as well as your **underlying health**. . . . On average, **3-5% of all babies** are born with a birth defect ranging from mild to severe

. However, there is no increase from the use of low-tech fertility treatments. When pursuing treatment, it is important to understand the risks, even if they are very low. . . . . .

Risk of Multiple Pregnancy

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When compared to at-home conception, some low-tech fertility treatments that use fertility medications are more likely to result in multiple pregnancies, such as twins, triplets, or greater. . Multiple pregnancies, in general, carry an increased risk of pregnancy problems. The most significant risk associated with multiple pregnancies is prematurity. On average, twins deliver three weeks earlier than singleton babies, with some delivering before the third trimester. Additionally, twin babies weigh approximately 2 pounds less than singleton babies. Triplet and higher order pregnancies deliver before the third trimester in almost half of cases. Babies that are born very premature face a higher incidence of bleeding into the brain, cerebral palsy, lung disease, intestinal disease, or visual and hearing issues. Additionally, multiple pregnancies also have an increased risk of pre-eclampsia, excess bleeding upon delivery, gestational diabetes, problems with the placenta, problems with the gallbladder, skin problems, the need for extra weight gain, and the need to be put on bedrest. The fetal death rate increases from 0.43% for singletons, to 1.55% for twins, and 2.1% for triplets. Multiple fetuses that share the same placenta, such as identical twins, have additional risks, such as a 20% chance of twin to twin transfusion syndrome, where circulation is not equal between fetuses. Twins sharing a placenta also have a higher frequency of birth defects and death of one fetus after the first trimester, which may cause harm to the remaining fetus. In the event of a triplet or higher order pregnancy, the obstetric risks significantly increase. If this happens, you might face an ethical dilemma of continuing a high-risk pregnancy or having a selective reduction performed. A selective reduction means that the development of one or more fetuses will be stopped for the sake of one or more remaining fetuses. Selective reduction is performed at about 11-12 weeks of pregnancy by giving one or more fetuses an injection under abdominal ultrasound guidance. This carries a 1% chance of losing the entire pregnancy, and these odds are increased if there are more than three fetuses present. If successful, the pregnancy will continue with fewer fetuses, reducing the risk of a more complicated multiple pregnancy outcome. No matter your situation, your medical team will help provide the information you need to make the best decision possible..

Next Steps

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By now, you should feel better informed about the processes, procedures, and considerations of a low-tech fertility treatment program. Millions of babies around the globe have been born thanks to fertility treatment. Over the years, medical advancements have led to higher pregnancy rates, fewer complications, and easier cycles. As with any medical journey, low-tech fertility treatment comes with risks and benefits. You may decide not to pursue low-tech fertility treatment after all,

or you may choose to go directly to IVF because you prefer a process with a higher likelihood of success. You and your medical