The Art of Conception

Infertility Services

KAISER PERMANENTE®

Contents

Welcome to Infertility Services at Kaiser Permanente

If you've been trying to conceive and haven't been able to, you're not alone. One out of 6 couples experience fertility problems at some time in their lives.

At Kaiser Permanente (KP), we recognize that coping with infertility can be a trying and frustrating experience. Our fertility care services involve a team approach that includes physicians, nurse practitioners, physician assistants, nurses, medical assistants, and lab technicians. As you navigate your next steps, our priority is to treat you with the respect and quality of care you deserve.

What is infertility?

Couples are considered "infertile" if they haven't conceived after 12 months of having intercourse without using any form of birth control. For a woman 35 or older, we recommend you start seeking evaluation if you haven't conceived after 6 months.

Who is eligible for services?

KP members who meet the criteria for infertility and are diagnosed as infertile are eligible.

What infertility services are available to patients?

- Basic education and literature about fertility issues.
- Blood tests and semen analysis.
- Pre-pregnancy screening tests.
- Diagnosis and treatment of recurring pregnancy loss.
- Initial consultation with an Ob/Gyn clinician.

When indicated, treatment options may also include:

- Medications
- Inseminations
- Advanced diagnostics
- Surgery
- Counseling
- In vitro fertilization (IVF)

It's important to check your infertility and drug coverage benefits. You can do this by:

- Calling a patient financial advisor at (925) 979-7768 or (833) 226-6761 (for Northern California members only).
- Calling the number on the back of your KP Health Plan card.
- Checking with your employer's benefits office.
- Checking your plan and coverage on kp.org.

Different employers offer different benefits and these may also change from year to year, so it's important to verify your coverage as soon as possible.

What questions should members ask?

How do we get started?

Contact your Ob/Gyn clinician or your primary care doctor if you're concerned about your ability to get pregnant or for a referral to infertility services. Your clinician may ask you to complete some basic tests and fill out your medical history first. Please complete these steps as soon as possible and bring any previous infertility records to the consultation visit.

Are there infertility support services?

Counseling is available through our Mental Health Department. You can call to make an appointment in either of these departments, or you can speak to your clinician about a referral for counseling services. Infertility support groups may be available through these organizations:

- American Society for Reproductive Medicine (asrm.org)
- RESOLVE, Inc (The National Infertility Association, telephone 703-556-7172 or resolve.org)

Additional information about infertility is available at kp.org/mydoctor. We have programs that can help you manage stress and make other lifestyle changes that could affect fertility. Contact your local Health Education Center for help finding resources and support.

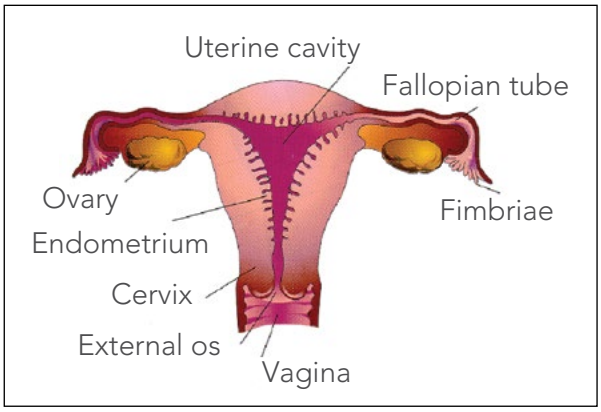
Overview: The Biology of Reproduction

Female Reproductive Anatomy

Eggs are stored, develop, and mature in the ovaries. The fallopian tubes carry the eggs that are released from the ovaries to the uterus during ovulation. Fertilization of an egg by a sperm occurs in the fallopian tube. If an egg is fertilized, it forms an embryo which will develop into a fetus in the uterus. The uterus has a specialized lining called the endometrium that allows an embryo to implant into the wall and provides the developing baby with nutrients and support.

What is the menstrual cycle and ovulation?

The menstrual cycle is controlled by the brain together with the ovaries. There are 4 main hormones involved in reproduction. Follicle stimulating hormone (FSH) and luteinizing hormone (LH) are produced in the brain by the pituitary gland. FSH stimulates the growth of the egg within the ovary; LH stimulates ovulation or the release of the egg. Estrogen and progesterone are produced in the ovaries and help prepare the lining of the uterus for implantation of an embryo.



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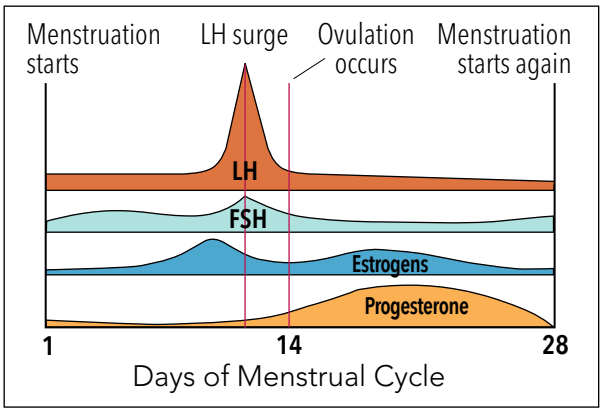

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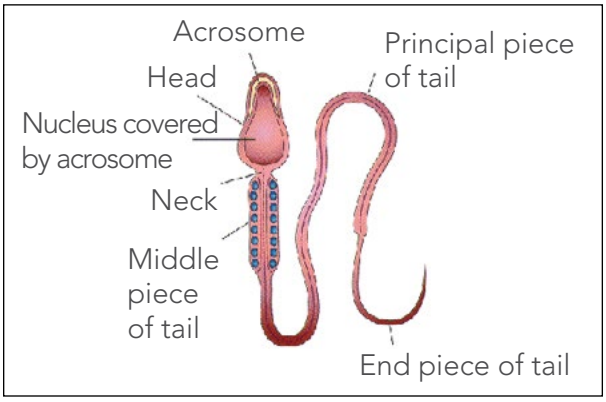
The menstrual cycle is measured in days, starting with day 1 as the first day of the menstrual period. Ovulation usually occurs on approximately day 14. If the released egg is not fertilized, the lining of the uterus (the endometrium) is sloughed off as the menstrual period. A 28-day cycle is average, but may vary in length.

Male Reproductive Anatomy

Millions of **sperm** are produced in the **testes** every day. Approximately 2 months are needed for sperm to develop and mature.



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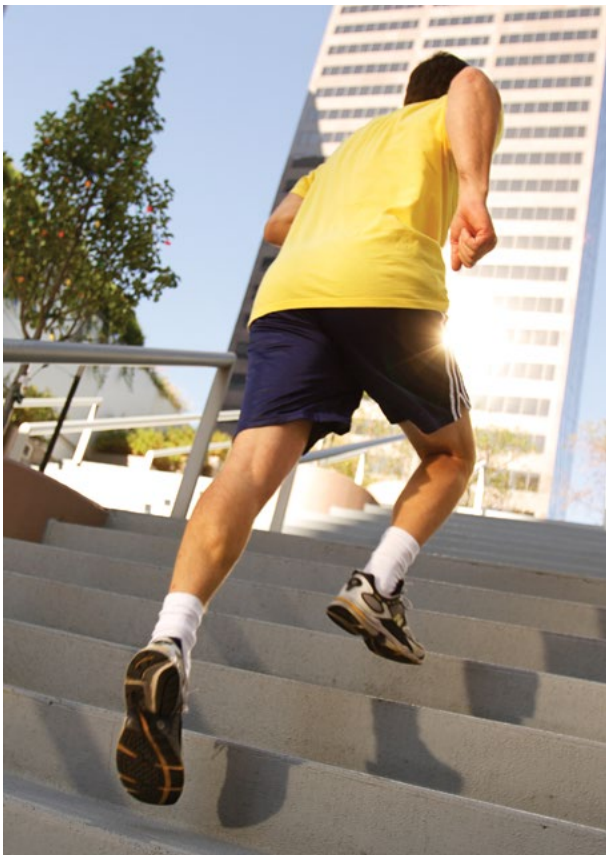
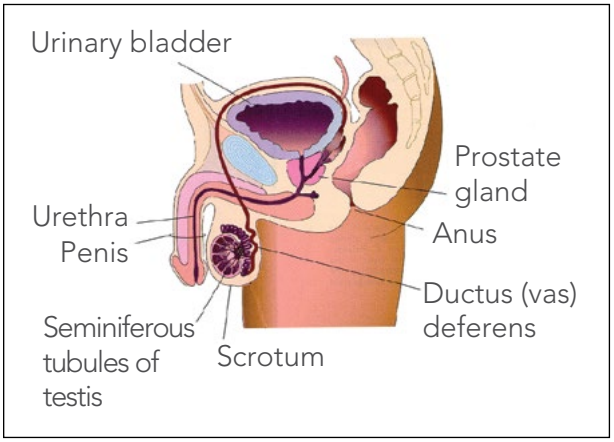
The **vas deferens** carries the sperm from the testicles to the urethra, where the **seminal vesicles** and **prostate gland** add fluid to form semen. Semen moves out of the body through the **urethra** in the **penis.** Approximately 40 million sperm are released at ejaculation. Sperm are very small and most of the semen consists of fluid that provides nutrients and enzymes to nourish the sperm.





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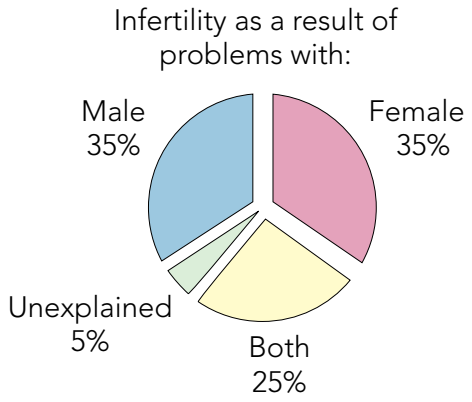
Overview: Some Causes of Infertility

Male or Female?

Infertility problems are associated about equally with male and female factors.

Males are most likely to have a problem with their sperm (volume, count, shape, movement). Sometimes infertility can be due to problems with testicles, prostate, or varicocele (large vein), or to illness, medications, or hormones. Female infertility can be due to egg quality or to ovulation, cervical, tubal, or pelvic factors. Weight and excess stress have also been linked to infertility. Both hormone functioning and reproductive anatomy are important for fertilization and fetal growth to occur.



Egg Quality

Egg quality refers to both the ability of an egg to become successfully fertilized and the ability of a fertilized egg to develop into a healthy baby. There are no tests that can directly measure egg quality but we know that it's closely associated with age.

Why is it harder to get pregnant as we get older?

Females are born with a certain number of eggs. As you age, the number of eggs, as well as the quality of the eggs, declines. As a result, when you're over 35 years old you have a lower chance of getting pregnant and a higher chance of having a miscarriage or a baby with genetic problems (such as Down syndrome).

Male fertility declines with age, as well. Sperm quality or sperm count can decline with age, and the risk for miscarriage increases as male age increases, too.

How can I tell if my eggs are a problem?

Age has the biggest impact on egg quality. There are also blood tests that can help your clinician determine your fertility level. Two blood tests that are commonly done are called FSH and estradiol. If your FSH level is high when your estradiol level is low, your chances of becoming pregnant and having a baby are decreased.

Although your blood test results may change from month to month, the highest FSH and estradiol results are often used to predict your chances of success.

Unfortunately, if blood tests show a lower chance of conceiving, there are few drugs or treatments to help you conceive using your own eggs. Egg donation or adoption can be an option. If the test results are normal, your clinician may prescribe fertility drugs. If you don't respond well to these drugs or if you're over age 35, your clinician may suggest moving quickly to an advanced fertility treatment called in vitro fertilization (IVF).

When to contact your doctor

If you're younger than 35 and haven't become pregnant after trying for 1 year, or if you're 35 or older and haven't become pregnant after trying for 6 months, call your clinician. Then, an infertility care specialist can start testing for infertility.

If a chronic condition known to impact fertility affects either you or your partner, or you have irregular periods, contact your clinician earlier than the times suggested.

What You Can Do to Increase the Chances of Getting Pregnant

While trying to conceive, you should practice good health habits including:

- Eating a well-balanced diet.
- Getting regular moderate exercise.
- Avoiding cigarette smoke, recreational drugs, and excessive alcohol consumption.

Additionally, it's important to take care of your emotional health (by reaching out for support or counseling), since stress can impact the ability to conceive and maintain a healthy pregnancy. Tell your clinician if you have a history of mental health issues or eating disorders.

Getting certain nutrients is also important. **We recommend taking 400 mcg of folic acid daily when you're trying to conceive.**

The easiest way to do this is by taking a standard multivitamin.

When should we have intercourse?

You should try to have intercourse every day or every 2 days during the fertile interval, near ovulation. Ovulation typically happens on or near day 14 of the menstrual cycle. (Day 1 of the cycle is the first day of a period.) Your cycle may be different, so it's helpful to know when you are ovulating.

Ovulation Prediction Kit

What is an ovulation prediction kit?

Ovulation prediction kits are easy-to-use test kits that you can buy without a prescription to help determine when you're about to ovulate.

About 12 to 14 days before a menstrual period, the brain releases its supply of luteinizing hormone (LH). This is called the LH surge and can be detected in your urine. The LH surge happens about 1 to 1½ days before an egg is released and triggers the egg's release from the ovary. You're most fertile around the time the egg is released. Generally, when the color of the predictor kit changes, you should have intercourse on that day and the following day. Kit brand names include Clear Blue Easy, Conceive, Q Test, Assure, and EZ-LH.

How do I use the ovulation prediction kit?

Be sure to carefully follow the direction from the kit you're using. It's best to test your urine in the morning after you've already urinated one time. You should begin testing on or around day 10 of your menstrual cycle unless your clinician tells you to start on a different day.

What Are Some Infertility Tests?

Your clinician will consider 4 main questions. These include:

- Are there enough moving, normally shaped sperm?
- Is ovulation occurring? If so, how often?
- Is anatomy normal? Can the egg and sperm meet?
- What is the quality and quantity of the eggs? What is the role of age?

Female Tests

Blood Tests

Follicle Stimulating Hormone (FSH) and Estradiol

What is FSH?

FSH is a hormone that stimulates the development of the follicle (egg) in the ovaries.

How is FSH measured?

FSH level is measured by taking a blood test usually on day 2 or day 3 of your menstrual cycle (day 1 is the first day of your period).

What do the test results mean?

FSH levels measure ovarian reserve, or how well the ovaries are working. A normal FSH means the ovaries are working well. An elevated FSH (greater than 10) is an early chemical indication of low egg quantity.

Your clinician will receive the results of your FSH test and determine if you fall into the normal, borderline, or abnormal (decreased fertility) range.

- **Normal:** An FSH of 10 or less indicates that your egg quantity is normal. However, it doesn't guarantee that you'll become pregnant, nor does it accurately predict how well you may respond to fertility medication.
- **Borderline:** A borderline FSH of 11 to 14 suggests that you have declining egg quantity (ovarian reserve). A borderline FSH indicates that your chances of pregnancy are low with or without treatment.
- **Abnormal:** An abnormal FSH (15 or higher) indicates low egg quantity. The chance for a successful pregnancy (using your own egg) is very low.

If you have an abnormal FSH, your clinician can counsel you about alternative ways to become a parent. FSH levels can vary from cycle to cycle. It's the highest FSH level that best predicts egg quantity. Any one FSH level that is abnormal predicts a poor response to fertility medications and a diminished ovarian reserve.

What is estradiol?

Estradiol (a form of estrogen) is made by the egg follicles as they grow in the ovaries. Estradiol, in addition to progesterone, prepares the uterine lining to receive the fertilized egg.

When is the estradiol test done?

The blood test to measure estradiol is taken at the same time as your FSH level (on day 2 or day 3 of your menstrual cycle).

A high estradiol level (greater than 80) may indicate that ovarian reserve is diminished and that a successful pregnancy is less likely. A high level may also be due to residual ovarian activity from a previous menstrual cycle.

Progesterone

What is progesterone?

Progesterone is the hormone made in the ovaries after ovulation. It's responsible for maintaining the lining of the uterus. This is important because the fertilized egg must attach to the lining in order to grow.

How is progesterone measured?

Progesterone is measured with a blood test during the second part of your menstrual cycle. This is usually a week after ovulation (around day 21, day 22, or day 23). If ovulation has occurred, your clinician will see a rise in your progesterone level.

Prolactin and Hyperprolactinemia

What is prolactin?

Prolactin is a hormone made in the pituitary gland, at the base of the brain. It's a hormone that stimulates milk production. Small amounts of prolactin normally circulate in the blood of nonpregnant, nonlactating (nursing) women.

Why do we test for prolactin?

Too much prolactin (hyperprolactinemia) can cause irregular periods and trouble ovulating and/or getting pregnant. It can also cause nonpregnant women to have a milky secretion from their breasts.

How do we test for prolactin?

A blood test measures your prolactin level. If your initial test is high, you may be asked to repeat the test. Sexual intercourse and breast stimulation should be avoided the day before prolactin testing.

What causes high prolactin?

In some cases, high prolactin is caused by one of the following: medications, low levels of thyroid hormone (hypothyroidism), some types of surgery, or a small, benign (noncancerous) growth in the pituitary gland (prolactin-secreting adenoma).

If prolactin is high, how is it treated?

First, the cause of the high prolactin level must be identified. You may be asked to take more blood tests and to get an MRI of the pituitary gland (brain scan) to try to determine the exact cause. In most cases, there is simple oral medicine that can be taken to reduce prolactin. Once prolactin levels are in the normal range, menstrual periods will usually become more regular and egg release (ovulation) will become more normal.

Fasting Blood Sugar

Fasting blood sugar is a common laboratory test that measures the level of your blood sugar after you haven't eaten for at least 8 hours. It's used to determine if you have diabetes or high blood sugar levels.

How can high blood sugar be treated?

In some cases, it can be controlled by diet alone. However, oral medications or insulin injections are sometimes necessary to control blood sugar levels. It's important to have well-controlled blood sugar levels before starting infertility treatment.

Rubella

What is rubella?

Rubella is a viral infection also known as German measles.

Why do we test for rubella?

If you're exposed to rubella during pregnancy and don't have immunity to it, your baby can have serious birth defects.

How do we test for rubella?

Before you attempt pregnancy, blood will be drawn to measure your immunity to rubella.

What does rubella nonimmune mean?

Nonimmune means that you have no protection against rubella disease. If you're not immune, you should speak to your clinician to receive

a vaccination prior to trying to get pregnant. You should not be pregnant when you receive the vaccine. You will be instructed to use birth control to avoid pregnancy for 28 days after you receive the rubella vaccination.

Imaging Studies

Hysterosalpingogram (HSG)

What is an HSG?

HSG is an X-ray procedure used to view the inside shape of the uterus and fallopian tubes. This shows whether the tubes are open or damaged, and whether the uterine cavity is normal. Problems in these areas may make it difficult to become pregnant.

How is an HSG done?

A liquid, dye-like solution is injected through the cervix, and as it flows up through the uterus and tubes it's viewed on an X-ray. Spillage of the dye from a tube indicates that the tube is open. The inner shape of the uterus is also checked for abnormalities.

When is an HSG performed?

A hysterosalpingogram is performed after all menstrual bleeding is over, but before ovulation. If you have a 28-day cycle, this is usually between day 6 and day 12.

Pelvic Ultrasound

What is a pelvic ultrasound?

An ultrasound uses high-frequency sound waves to create pictures of your internal organs. A pelvic ultrasound scans your uterus and ovaries.

How does it work?

There are various types of ultrasound that all work on the same principle. Sound waves are directed into a specific area of your body through a microphone-like device called a transducer. This can be done in 2 ways. In an abdominal pelvic ultrasound a special gel, which helps to conduct the sound waves, is applied to your abdomen. The transducer glides across your skin to scan your pelvis.

In early pregnancy, or if you have infertility, it's easier to view the pelvic organs through the vagina. This procedure is called a transvaginal ultrasound. A transvaginal transducer is inserted into your vagina to produce images of the pelvic organs.

When is it used?

Ultrasound is used to help detect uterine fibroids and polyps, ovarian cysts, and early pregnancy. It can also examine the thickness of the endometrial (uterine) lining. With infertility, it can help monitor egg (follicle) growth and ovulation. Transvaginal ultrasound is also used for egg retrieval during IVF.

What are the risks?

Ultrasound has been used for over 30 years and no harmful effects have been noted. No radiation, dyes, drugs, or chemicals are used in ultrasound. An ultrasound may be uncomfortable for some women but is not painful.

Hysteroscopy

What is a hysteroscopy?

A hysteroscopy is a way of looking at the inside of a uterus. A small, lighted scope is placed through the vagina, up into the uterus. This view is helpful in diagnosing problems within the uterus such as polyps, scar tissue, abnormal shapes or membranes, and fibroids.

Surgery

What is a laparoscopy?

A laparoscopy is a surgical procedure that allows the doctor to look inside the pelvis. To do this type of surgery, a doctor puts a lighted scope and other surgical tools through small incisions in the belly. The doctor may be able to see if scar tissue, ovarian cysts, tubal blockage, or endometriosis is present. These conditions may be treated during the same surgery.

What is a laparotomy?

Laparotomy is a surgical procedure that is done to remove fibroids or severe scarring in the pelvis. It's done through one incision in the belly. The incision may be small (2 to 3 inches) or larger, up to 4 to 5 inches.

Male Tests

Semen Analysis

What is semen analysis?

Semen analysis is one of the most basic laboratory tests for a couple undergoing an infertility work-up. We analyze a semen specimen to determine if the quality or quantity of sperm is a contributing factor.

What is a normal semen analysis?

Kaiser Permanente follows the World Health Organization (WHO) guidelines for normal values when analyzing:

- Volume
- Sperm count
- Motility (percentage of moving sperm)
- Morphology (shape of the sperm)
- White blood cells

Your clinician will interpret your results. The combination of volume, sperm count, and percentage of motile sperm determines the amount of active sperm and may provide an informative way to interpret the data:

volume × count × % motility = total motile sperm

How do you collect semen for the analysis?

- Obtain a container for collection from your clinician.
- Abstain from any ejaculation for 2 or 3 days before your collection date.
- Collect specimen by masturbation directly into the container.
- Don't use a condom for collection because some contain agents that kill sperm.
- Keep the specimen warm by placing the container directly next to the body. Deliver the specimen to the laboratory within 1 hour.

Be sure to check the laboratory address and collection times prior to obtaining the specimen. Collection times vary from lab to lab.

How are low or abnormal semen analysis counts treated?

Your clinician will discuss the results with you. They may ask you to repeat the semen analysis to confirm an abnormal count. If needed, you may be referred to a specialist called a urologist, or have other blood tests done.

Usually the treatment for a mildly abnormal semen analysis is to do intrauterine insemination. The process of preparing the sperm to be placed directly into the uterus is called sperm washing.

If the sperm count is extremely low, your clinician may suggest using donor sperm or assisted reproductive technology (ART), such as IVF with intracytoplasmic sperm injection (ICSI). Your clinician will discuss options if these factors are identified as contributing to your ability to conceive.

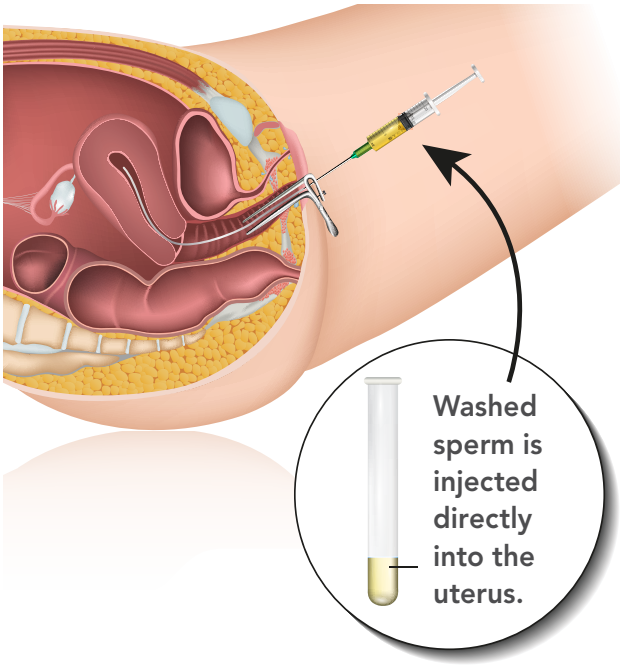
What Treatments Are Available?

Depending on the results from your initial workup, including lab tests, physical exam, and history, your clinician will discuss what treatment will be most effective for you and where you should start. Everyone is different, and you may have to try a number of treatments or combinations of treatments to achieve a successful result. Below is a brief introduction to some of the treatments you may hear about or need to undergo.

Fertility Medications

The use of fertility medication ranges from noninvasive oral medications with little or no side effects to injections with more significant side effects.

- **Clomiphene citrate (Clomid).** This is an oral medication that has been used for many years. It's been very effective, especially for irregular or no ovulation. It can help improve ovulation by increasing the production of hormones that stimulate egg development. Your clinician may suggest other medications that might work better for you.
- **Gonadotropins.** These provide an extra supply of FSH and LH, helping to stimulate the development of eggs. Taking these medications is a more intense process that involves daily injections at home and frequent blood estrogen (estradiol) level and ultrasound evaluations.
- **Endocrine medications.** These may improve fertility and include cabergoline or bromocriptine (for elevated prolactin), thyroid medication (for an under-or overactive thyroid), insulin (for diabetes), metformin (for selected polycystic ovarian syndrome patients).



Intrauterine Insemination

Insemination is a procedure that uses a small flexible tube attached to a syringe to place washed sperm into the uterus.

Intrauterine insemination (IUI) is done after a sperm wash has removed prostaglandin, bacteria, and unwanted debris from the collected sperm. The washed sperm are placed through the cervix directly into the uterus, closer to the ovulated egg. Insemination can be done with sperm from your partner, or sperm from a known or anonymous donor. Insemination is helpful when there is a problem with the sperm, the cervix, or when pregnancy is desired without a male partner. Kaiser Permanente performs sperm donor inseminations, but check your plan and coverage.

In Vitro Fertilization (IVF)

Through IVF, your own eggs can be fertilized outside the body and placed back in the uterus to develop. This process can also be done by using donor eggs. Kaiser Permanente has three IVF programs, in San Francisco, Fremont, and Sacramento.

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Your reproductive health can be seriously affected by violence or abuse. If you are hit, hurt, or threatened by a partner or spouse, there is help. Call the National Domestic Violence Hotline at 1-800-799-7233 or connect to **ndvh.org**.

This information is not intended to diagnose health problems or to take the place of medical advice or care you receive from your physician or other health care professional. If you have persistent health problems, or if you have additional questions, please consult your doctor. Kaiser Permanente does not endorse the medications or products mentioned. Any trade names listed are for easy identification only. Some photos may include models and not actual patients.

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