Do I Have Premature Ovarian Failure?

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health
National Institute of Child Health and Human Development

Fast Facts:

Common Name:	Premature Ovarian Failure or POF
Medical Name:	Premature Ovarian Failure, Primary Ovarian Insufficiency
Number of Women Affected:	Approximately 250,000 women under the age of 40 in the United States have POF.
Common Symptoms:	Absent or irregular periods, hot flashes, night sweats, irritability, poor concentration, decreased sex drive, painful sex, drying of the vagina, and infertility. Women with POF are also more likely to develop certain conditions, including osteoporosis, Addison's disease, and low thyroid function.
Common Treatments:	Doctors often prescribe hormone replacement therapy to relieve some of the symptoms of POF. Currently, there is no treatment that is proven safe and effective in restoring normal function of the ovaries or improving fertility.
Does This Disorder Affect Fertility/ Childbearing?	It is difficult for women with POF to become pregnant because their ovaries are not functioning properly. But, between 5 percent and 10 percent of women with POF become pregnant without treatment.

Premature ovarian failure (POF) has baffled researchers and health care providers for decades. Scientists have yet to uncover why, in some women, normal functioning of the ovaries stops before these women naturally reach menopause, even though they seem otherwise healthy.

The National Institute of Child Health and Human Development (NICHD), part of the National Institutes of Health (NIH), is trying to learn more about POF through research into its causes, its symptoms, and its patterns. Hormones, genes, the immune system, and other factors may all play a role in POF. The NICHD hopes that its research will lead to advances in treatment for POF, so that this disorder will no longer be a factor in women's lives.

What is premature ovarian failure (POF)?

Health care providers use the term POF to describe a stop in normal functioning of the ovaries in a woman under the age of 40. Many women naturally experience a decline in fertility at age 40; this age may also mark the beginning of irregularities in their menstrual cycles that signal the onset of menopause. For women with POF, the fertility decline and menstrual irregularities occur before age 40, sometimes even in the teens. Some health care providers also use the term *primary ovarian insufficiency* to describe this condition.

In the past, health care providers called this condition *premature menopause*, but this term is not an accurate description of what happens in a woman with POF. A woman who has gone through natural menopause will rarely ever have another period; a woman with POF is much more likely to have periods, even though they might not come regularly. There is virtually no chance for a woman who has gone through menopause naturally to get pregnant; in some cases, a woman with POF can still get pregnant.

What causes POF?

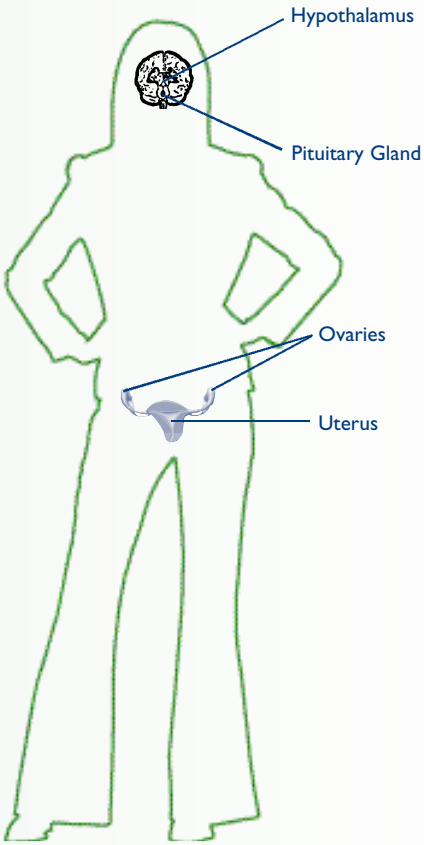
Although researchers have a general idea of what causes POF, in most cases the exact cause remains unclear.

To understand what happens in POF, you need to understand what happens in a woman's body when it's functioning normally.

The Normal Menstrual Cycle

In general, a woman's reproductive health involves her:

- **Hypothalamus** (pronounced high-poe-THAL-amus)—part of the brain that functions as the main control for the body's reproductive system. The hypothalamus works like a thermostat in a furnace, in that it controls the levels of different hormones and other chemicals in the body. If the hypothalamus detects that there is too little of a hormone in the body, it orders the body to make more.
- **Pituitary** (pronounced pitt-OO-ih-terry) **gland**—the body's master gland. The pituitary sends out hormones, or chemical signals to control the other glands in the body. The pituitary gets orders from the hypothalamus about what the body needs.
- **Ovaries**—the source of eggs in a woman's body. The ovaries have **follicles**, which are tiny, fluid-filled sacs that hold the eggs. The ovaries also make hormones that help to maintain a woman's health, such as estrogen, progesterone, and testosterone. The ovaries receive the chemical signals from the pituitary and respond by making certain hormones. In POF, the ovaries stop working correctly in both their egg production role, and in their hormone production role.
- **Uterus**—where a woman carries a baby, also called the "womb." The uterus has different layers; its innermost layer or lining is called the **endometrium**—endo means "inside" and metrium (pronounced MEE-tree-um) means "womb." The endometrium functions as a bed for an embryo when a woman is pregnant. If no pregnancy occurs during the cycle, then the endometrium is shed as a menstrual flow, or a period, and the cycle starts all over again.



These parts interact with one another to coordinate a woman's monthly menstrual cycle.

- The **hypothalamus** keeps track of the level of **estradiol** (pronounced ess-trah-DYE-awl) in the body. Estradiol is the natural estrogen that a woman's body makes, so we'll call it estrogen from now on.
- When the level gets low, the hypothalamus sends an order to the pituitary gland telling it that the body needs more estrogen.
- The pituitary gets the order and responds by sending out **follicle stimulating hormone (FSH)**, a hormone that causes the follicles on the ovary to grow and mature. Mature follicles make estrogen and other substances, such as inhibin. The pituitary continues to make FSH until the mature ovarian follicles make enough estrogen. If the follicles don't make enough estrogen, the level of FSH goes even higher.
- When the level of estrogen gets high enough, the hypothalamus and pituitary know that there is a mature egg in one of the follicles. To get this egg to the uterus so that it can be fertilized, the pituitary sends out a large burst of **luteinizing hormone (LH)**. LH breaks open the mature follicle to release the egg, which allows it to move toward the uterus. The level of LH is only high during the time an egg is being released. This LH burst is the basis for home ovulation detection kits. Because LH may be high throughout much of the menstrual cycle in women who have POF, home ovulation detection kits are unreliable in these women.
- The empty follicle is then transformed into a yellowish, **corpus luteum** (pronounced CORE-puss loo-TEE-um). Corpus means "body" and luteum means "yellow." The corpus luteum makes progesterone, the hormone that prepares the uterus for pregnancy.
- Increased levels of progesterone cause the endometrium to change in preparation for pregnancy, should it occur. Once the endometrium is properly prepared, it can support an embryo and allow the embryo to grow.
- If the egg is fertilized, it sends out a hormone called HCG to let the body know that it's there. HCG causes the corpus luteum to continue to make progesterone, the hormone needed for pregnancy. Pregnancy tests measure the level of HCG. If HCG is present, then it's likely that a woman is pregnant.
- If there is no signal, that is, no HCG is present because the egg wasn't fertilized, the corpus luteum stops making progesterone. Without progesterone, the endometrium starts to break down, and the woman's body sheds it as her period.

What happens differently in POF?

Currently, researchers are unable to pinpoint exactly what happens in POF to stop normal function of the ovaries in most cases. Remember that the FSH levels are high when the ovaries fail to produce enough estrogen. LH levels also stay high in many cases, even during the occasional times that follicles successfully grow. Mature follicles in the ovaries make estrogen, as well as other substances, including the protein inhibin. Because women with POF have low levels of estrogen, scientists are focusing their attention on the follicles in the ovary in their study of POF.

Follicles in the ovaries start out as microscopic seeds, called**primordial** (pronounced prime-OR-dee-ul) **follicles**. These seeds are not yet follicles, but can grow into them. In general, a woman is born with about two million primordial follicles, which should be enough to last her until she goes through menopause. But this may not be the case for a woman with POF. Women with POF may fall into one of two groups.

Follicle Depletion

A woman with follicle depletion has no responsive follicles left in her ovaries. There is no way for the body to make more primordial follicles. And, currently, there is no way for scientists to make primordial follicles. Although scientists haven't identified all the causes of follicle depletion, some known causes include:

- Chemotherapy or radiation therapy—strong treatments for cancer

- An abnormal or missing X chromosome—the X chromosome stores genetic material that helps "build" a person. It also helps to determine whether a person is a male or a female. Females need two normal X chromosomes to make enough primordial follicles, and to use them properly. If a critical part of either X chromosome is missing, or if an entire X chromosome is missing, the body may not make enough primordial follicles to begin with, or it may use them up too quickly. This problem is the cause of POF in 2 percent to 3 percent of women with the condition.
- Even when it appears that all a woman's follicles are depleted, it is possible that a very small number of surviving follicles can, without warning, begin to function

on their own. This spontaneous function can cause ovulation or a menstrual period; if insemination occurs, this function could lead to pregnancy, although such a situation is uncommon. Currently, health care providers can't predict which women with POF will experience this recovery of ovarian function.

Follicle Dysfunction

A woman with follicle dysfunction still has follicles in her ovaries, but for unknown reasons they are not working properly. Currently, scientists do not have a safe and effective way to make follicles start working normally again. Although they have yet to identify all the causes of follicle dysfunction, some known causes include:

- An autoimmune attack—the immune system normally protects the body from invading bacteria and viruses. In some women, though, for reasons researchers don't understand, the immune system attacks developing follicles, which prevents the follicles from working the way they should. Current research suggests that this type of problem occurs in 5 percent of women with POF.
- A low number of follicles—even though only one mature follicle releases an egg each month, that follicle usually has less mature follicles developing along with it. Scientists don't understand exactly how, but these supporting follicles seem to play a role in helping the mature follicle function normally. If these extra follicles are missing, the dominant follicle becomes luteinized and will not mature and release an egg properly. Current research estimates that this problem may occur in up to 60 percent of women with POF, but this is not a definite number.

Research also shows that 10 percent to 20 percent of women with POF have a family history of the condition, which could mean that some cases of POF have a genetic component. But, inheritance patterns show that POF is not a purely genetic disorder. Research into the causes of POF is ongoing, in hopes that knowing why it occurs will also help in developing treatments for the disorder.

How many women have POF?

POF affects approximately:

- One in 10,000 women by age 20
- One in 1,000 women by age 30
- One in 250 women by age 35
- One in 100 women by age 40

What are the symptoms of POF?

The most common first symptom of POF is having irregular periods. Health care providers sometimes dismiss irregular or skipped periods (sometimes called amenorrhea—pronounced AY-men-or-ee-uh) as being related to stress; but a woman's monthly cycle is actually an important sign of her health, in the same way that blood pressure or temperature are signs of health. If you have irregular periods or skip periods, you should tell your health care provider, so that he or she can begin to determine the cause of these problems.

Some women with POF also experience other symptoms with POF. These symptoms are similar to those experienced by women who are going through natural menopause and include (but are not limited to):

- Hot flashes
- Night sweats
- Irritability
- Poor concentration
- Decreased interest in sex
- Pain during sex
- Drying of the vagina
- Infertility

How do I know if I have POF?

One of the most common signs of POF is having irregular periods. Women should pay close attention to their menstrual cycles, so that they can alert their health care provider when changes occur in their periods.

If you are under age 40 and your periods are irregular, or if you miss your period altogether for three months or more, your health care provider may measure the level of FSH in your blood, to determine if you have primary ovarian insufficiency in its early stages, or possibly even fully developed POF. Remember that FSH signals the ovaries to make estrogen. If the ovaries are not working properly, as is the case in POF, the level of FSH in the blood increases. A higher level of FSH in the blood is a strong sign of POF. But, irregular periods alone are not a sure sign that you have POF—research shows that fewer than 10 percent of women who have irregular or skipped periods have high FSH levels and POF.

To do an FSH test, your health care provider will collect some of your blood and send it to a laboratory. At the lab, a technician will check the level of FSH. If the level of FSH is in the menopausal range, it is likely that you have POF.

Are there treatments for the symptoms of POF?

Currently, no proven treatment will restore normal function to a woman's ovaries. But, health care providers can suggest treatments for some of the symptoms of POF.

One of the most common treatments for women with POF is **hormone replacement therapy (HRT)**. In women with POF, HRT gives their bodies the estrogen and other hormones that their ovaries are not making. Replacing these hormones causes a woman with POF to start having regular periods again. In addition, HRT may help women with POF lower their risk for the bone disease osteoporosis.

HRT is usually a combination of the hormones estrogen and progesterone (or the man-made form of progesterone, called progestin). Women can take the therapy as a pill, or they can wear a patch that sticks to their skin to get the hormones into their bodies. Many health care providers suggest the patch for women with POF because it offers a continuous flow of hormones into the blood stream, which mimics the way the body naturally releases estrogen. The combination and amount of hormones used in HRT may differ for different women. If you have questions about HRT as a treatment for POF, talk to your health care provider.

Most health care providers suggest that women with POF take HRT until they are 50 years old. After that time, women should talk with their health care provider about stopping HRT because of risks

associated with older women taking the therapy after menopause.

Current research is also looking into the benefits of replacing the hormone testosterone to prevent bone loss in women with POF. Most people think of men's health when they hear the word testosterone, but women's bodies also make testosterone, at a level about one-seventh that of men. Testosterone helps to maintain muscle and bone mass, and may be related to a woman's sex drive. The ovaries make testosterone, and its level is lower in women with POF. But, unlike estrogen and progesterone, testosterone is not usually replaced as part of HRT. A clinical trial is now underway to see if raising the level of testosterone in women with POF to that found in a woman with healthy ovaries can slow or stop bone loss. The results of this study could benefit not only women with POF, but also other young women who are at risk for osteoporosis.

For more information on this or other NICHD clinical trials related to POF, contact the Unit on Gynecologic Endocrinology, at **1-877-206-0991**, or visit the Unit's Web site at **http://pof.nichd.nih.gov.**

Is HRT safe for me to take if I have POF?

Most health care providers believe that HRT replaces what your body should be making naturally as a young woman, and that your body needs these hormones to function normally. HRT taken by women with POF is very different from the hormone therapy that is often taken by women who are going through or have already gone through natural menopause.

Recently, a study found that older women, who had gone through normal menopause, were at increased risk for certain health conditions when they took a certain type of hormone therapy for long periods of time. The study was part of the Women's Health Initiative, a large, multi-center study that involved more than 161,000 postmenopausal women in their fifties, sixties, and seventies. The researchers found that these women, who went through natural menopause at the expected age, were at greater risk for stroke, blood clots, heart disease, heart attacks, and breast cancer after taking a specific type of hormone therapy for more than five years.

These results do not apply to young women taking HRT; specifically, these results don't apply to young women with POF. Women in the study mentioned above were between the ages of 50 and 79 when the study began and had gone through menopause at the normally expected time; their bodies would not normally be making high levels of hormones. The type of therapy taken by women in the Women's Health Initiative study could be called hormone *extension* therapy, rather than hormone *replacement* therapy, as is often reported. These women took the hormones beyond the time that the hormones would naturally be present. Women with POF get hormone *replacement* therapy; that is, the HRT is providing something their bodies would normally be making, if they didn't have POF.

The type and amount of HRT prescribed to women with POF is different from the hormone therapy taken by women in the Women's Health Initiative study. For example, women with POF usually take *full-dose estrogen replacement* therapy, meaning the amount of estrogen is nearer or equal to the level normally found in a young healthy woman, whose ovaries are working properly, before menopause. Hormone therapy for women who have already gone through menopause is a much lower dose. And, women with POF typically use a patch to deliver the hormone estrogen, but take a pill that provides progestin. This regimen is different than the one used in the Women's Health Initiative, which had women take a pill that contained both estrogen and progestin.

Talk to your health care provider if you have questions about HRT as a treatment for POF. He or she can explain the benefits and risks of HRT for your specific situation as a young woman. It is important to remember that young women with POF differ from older menopausal women in many significant ways. Your health care provider should consider these issues when deciding on the best treatment for you.

Go to the **Where can I go for more information on POF?** section of this booklet for more information about the Women's Health Initiative.

How will having POF affect my overall health?

Because of lower hormone levels that result from POF, you are at greater risk for a number of health conditions. These conditions, and what you can do to stay healthy, are described below.

Osteoporosis

- Osteoporosis (pronounced OWS-tee-oh-pour-oh-siss) is a bone disorder that decreases bone strength and increases the risk for breaks and fractures.
- Estrogen helps to conserve calcium and other minerals in bones and protects against bone loss. In POF, the ovaries stop making estrogen, which can cause women to lose bone density, or bone strength, one of the major factors leading to osteoporosis.
- Even though osteoporosis is more common in people ages 50 and above, women with POF may experience the condition at a much younger age.

Are there ways to prevent or treat bone conditions in women with POF?

To protect against bone loss, the National Osteoporosis Foundation[1] recommends that women who are at risk for osteoporosis:

- Get at least 1200 mg of calcium in their diets every day. If it is not possible to get this amount through diet, take a calcium supplement.
- Get between 400 IU and 800 IU of vitamin D, which helps the body absorb calcium, every day.
- Get regular, weight-bearing and muscle-building physical activity. Weight-bearing physical activity, such as walking, will help build bone strength. Activities like yoga or tai chi help build muscle strength and improve flexibility.

An adequate level of estrogen in the body is an important factor in preventing bone loss that may lead to osteoporosis. The strategies listed here may slow bone loss, but none of them will prevent bone loss entirely.

[1] *A Physician's Guide to Prevention and Treatment of Osteoporosis.* National Osteoporosis Foundation, Washington, DC; 1998, 2000.

Low thyroid function

- This problem is also called **hypothyroidism** (pronounced high-poe-THIGH-royd-iz-em).
- The thyroid is a gland, like the ovary, adrenal, and pituitary glands. It makes and releases hormones. Specifically, the thyroid makes hormones that control the body's metabolism and energy level. Low levels of the hormones made by the thyroid can affect metabolism, and can cause a woman to have very low energy.
- Symptoms include a slow down in the body's normal rate of functioning, which can lead to mental and physical sluggishness. Cold feet are also a feature of low thyroid function.
- A recent study found that 27.0 percent of women with POF also had low thyroid function. In the general population, only two percent of all people (both men and women) have low thyroid function.

Are there ways to prevent or treat low thyroid function in women with POF?

Replacing the hormone that the thyroid is not making enough of treats this problem. Usually, you can take a pill to replace the hormone.

Addison's disease

- Addison's disease is an autoimmune disorder, meaning the body's immune cells, which normally protect the body from invading cells and microbes, attack the adrenal glands, part of the endocrine system located above the kidneys. The adrenal glands produce hormones that regulate the body's response to stress and its handling of salt.
- Addison's disease is also called *primary autoimmune adrenal insufficiency.*
- Recent studies suggest that 3.2 percent of women with POF also have Addison's disease, making them much more likely than members of the general population to develop the disease.
- Symptoms of Addison's disease include loss of appetite, weight loss, dizziness when standing, and fatigue. In later stages of Addison's disease, salt craving, low blood pressure, and darkening of the skin may occur.
- Current research indicates that an *adrenal antibody test* is the most effective way to detect Addison's disease in women with POF. If the results of this test are positive, a health care provider may order a second test, called an *ACTH stimulation test*, to confirm the diagnosis. Both tests involve collecting blood samples.

Are there ways to prevent or treat Addison's disease in women with POF?

While there is currently no way to prevent Addison's disease, the best way to treat it is to find out whether you have it. You can easily manage the condition with the help of your health care provider, by taking medication that replaces the hormones your adrenal glands are not making. If left untreated, however, the disease can be life threatening because the body can't respond properly to stressful events, such as severe illness, injury, or surgery.

Researchers now recommend that health care providers screen all women who have confirmed POF for Addison's disease using the adrenal antibody test, although such screening is not yet standard practice. If women with undetected Addison's disease undergo an exceptional physical stress, such as surgery or a car accident, they are at risk for an "adrenal crisis," a situation that can lead to shock and even death. Therefore, screening for the disease is especially important before a woman with POF has surgery or undergoes other known physical stresses.

Heart disease[2]

- While it is very rare for a young woman with POF to develop heart disease, certain factors related to the disorder might increase her chances of developing heart disease later in life.
- Lower levels of estrogen in POF can lead to higher levels of low-density lipoprotein (LDL) cholesterol. LDL is known as "bad" cholesterol because it is the main source of the buildup and blockage in arteries that can lead to heart attacks.
- Lower levels of estrogen in POF can also lead to lower levels of high-density lipoprotein (HDL) cholesterol, known as "good" cholesterol because it helps prevent buildup and blockage in the arteries.
- After some time, buildup of cholesterol in the arteries can cause "hardening of the arteries," which means that the blood flow to the heart is slowed down or blocked. Blood carries oxygen to the heart. If the heart can't get enough oxygen, a person may have chest pains. If the blood supply to part of the heart is cut off completely, because of blockage, the result is a heart attack.

Are there ways to prevent heart disease in women with POF?

Getting adequate estrogen therapy may help guard against heart disease. Estrogen helps the body by:

- Keeping the lining of the arteries healthy
- Relaxing muscles that control arteries to allow better blood flow to tissues
- Normalizing LDL and HDL levels to decrease cholesterol build up in the arteries that could lead to blockage

[2] Adapted from *High Blood Cholesterol: What You Need to Know.* National Cholesterol Education Program, NHLBI, 2001.

Maintaining a healthy body weight and getting regular physical activity are important in reducing the risk of heart disease. These factors can affect your cholesterol level, which, in turn, can affect your risk for heart disease. Other risk factors for heart disease include:

- Cigarette smoking
- High blood pressure (defined as 140/90 mm/Hg or higher, or being on blood pressure medication)
- High blood cholesterol
- Family history of heart disease
- Age: women—55 years or older

Talk to your health care provider about heart disease to determine what steps, if any, you should take to lower your risk. For information on heart disease and how to lower your risk of heart disease, see the **Where can I get more information about POF?** section of this booklet.

Are there other health concerns for women who have POF?

- Among women with POF, studies show that 13.8 percent of women with a family history of POF, and 2.1 percent of women without a family history of POF may also have a mild form of Fragile X syndrome.
- Fragile X syndrome is a genetic condition that arises because of an error in a single gene. In women with an affected gene, the symptoms can range from none at all, to learning disabilities and problems with math, to a slightly higher risk of anxiety disorder. Women who have an affected gene may pass it on to their children, who may experience learning disabilities and other problems as a result.
- If you have a confirmed diagnosis of POF, you should talk to your health care provider about Fragile X syndrome and tests to find abnormalities in the Fragile X gene.
- For more information about Fragile X syndrome, talk to your health care provider, or contact the NICHD Information Resource Center at **1-800-370-2943**.

Does having POF mean that I'll be infertile or unable to have children?

If you have POF, it will likely be very difficult for you to become pregnant because your ovaries aren't working correctly. At this time, there is no proven medical treatment that improves a woman's ability to have a baby naturally if she has POF.

There is a chance that you will become pregnant without fertility treatment. Between 5 percent and 10 percent of women with POF do become pregnant, even though they have not had fertility treatment. Sometimes pregnancy can occur decades after the initial diagnosis. Researchers cannot explain why some women with POF get pregnant, while others do not.

Because pregnancy is still possible for women who have POF, those who do not want to become pregnant should take steps to prevent pregnancy. In some women with POF, oral contraception may not be as effective for pregnancy prevention as it is in women who don't have POF. In some cases, using a "barrier" method of contraception, such as a diaphragm or a condom, may be a better option for women with POF who don't want to become pregnant. Discuss your contraception needs with your health care provider, if you have POF and don't want to become pregnant.

If you have POF and want to become pregnant, you and your family have some options, explained below. You should also know, however, that some medical therapies for infertility have been proven **ineffective**, through randomized clinical trials. These therapies include high-dose estrogen therapy, gonadotropin-releasing hormone (GnRH) agonist therapy, corticosteroid therapy, high-dose GnRH therapy, and treatment with danocrine. Health care providers recommend avoiding unproven fertility treatments because such methods may actually *reduce* your chances of getting pregnant naturally.

A special note about infertility associated with POF

Many women involved in POF support groups reported that, when they were diagnosed with POF, they felt a sense of loss or grief, not unlike the sadness associated with the death of a loved one. Others reported that they felt guilty about

not trying to have children earlier in their lives. They noted that the diagnosis also affected their partners, spouses, and families. For women with POF and their families, then, emotional support may be as important as medical treatment for dealing with POF.

Health care providers who care for women with POF often have to reassure their patients that these emotional responses are perfectly natural reactions to the news of POF. Some health care providers suggest taking time to deal with the diagnosis and the emotions that surround it, before making any decisions about having a family (see *The Art of Listening* for more information).

Many providers recommend that women with POF and their families work with a "professional listener" to help deal with the powerful and sometimes painful emotions associated with this diagnosis. A social worker, a psychologist, a psychiatrist, or another mental health professional can work with a woman individually, together with a spouse, partner, or a family member, or in some combination of these arrangements. For information on finding a professional listener, talk to your health care provider, or go to the **Where can I go for more information about POF?** section of this booklet.

Many women in support group settings reported that talking to other women who had POF was helpful in coming to terms with their diagnosis. Many hospitals and health clinics offer support groups for

women and families affected by POF. To learn more about support organizations, go to the **Where can I go for more information about POF?** section of this booklet.

What are my options for having a child?

Families affected by POF do have options for having a child. As mentioned earlier, avoid unproven fertility treatments and treatments that have been proven ineffective because such methods may actually reduce your chances of getting pregnant naturally.

Adopting a child is one option for starting a family if you have POF. Adoption can be one of the most rewarding experiences of a lifetime; but the process is not without risks. Many health care providers recommend that families considering adoption learn about the process, its benefits and risks, and its legal aspects, in addition to the possible

emotional effects, before making a decision. For more information on adoption and adoption resources, go to the **Where can I go for more information about POF?** section of this booklet.

A certain type of assisted reproductive technology (ART), known as egg donation, may also be an option for having a child. In POF, the problem is in producing healthy eggs; the condition does not affect a woman's uterus, which means she may be able to carry a child. Egg donation makes it possible to combine donor eggs and sperm in a laboratory, and then place the resulting embryos into the uterus of a woman who has POF.

All forms of ART are complex, and each carries its own benefits and risks, some of them serious. Because few insurance companies currently provide coverage for this procedure, families may have to cover the entire cost of the process. And, many families have to try ART several times before it is successful. The Centers for Disease Control and Prevention (CDC) provides statistics on success rates of ART procedures based on different factors. Go to the **Where can I go for more information on POF?** section of this booklet for information on how to obtain a copy of the CDC report.

If you and your family are considering ART, talking with a health care provider and/or a fertility specialist about the risks and benefits may help you make your final decision. The **Where can I go for more information on POF?** section provides information on how to find a fertility specialist and lists resources on ART.

In addition, researchers are actively working to develop methods that improve fertility in women with POF and other conditions. As such methods and treatments improve, women with POF and their families may have more options for having children naturally.

The Art of Listening

NICHD researcher Larry Nelson, M.D., has been caring for women who have POF for decades. As the head of the NICHD's Unit on Gynecologic Endocrinology, Dr. Nelson is working to understand POF, and to help women and families affected by it.

"Many women feel a sense of urgency to act right away when they get their diagnosis," Dr. Nelson explains. But, based on his years of experience, he suggests a slower, more deliberate plan to his patients for dealing with infertility related to POF.

First, he recommends that women allow themselves time to feel and deal with the emotions that may accompany a diagnosis of POF. He explains that getting emotionally healthy, no matter how long it takes, is the best way to prepare for the tough decisions that may be down the road.

Next, Dr. Nelson suggests that the women strengthen their relationships with their spouses, partners, and families. He feels that the help of a professional listener is very important in building strong, close relationships after a POF diagnosis.

The options for having a child if a woman has POF are risky, expensive, and often emotionally draining, he adds. He usually tells his patients and their families to take some time to really focus so they can make clear, informed decisions. After taking some time, families may decide that options for having a child simply aren't right for them, he explains; or, they may decide to pursue the options for having a child.

Dr. Nelson received the 2001 Art of Listening Award from the Genetic Alliance for his commitment and dedication to caring for women with POF. The Genetic Alliance is a national non-profit organization that strives to help those affected by genetic disorders. To contact the Unit on Gynecologic Endocrinology, call **1-877-206-0911**.

What are researchers doing to learn more about POF?

Currently, the NICHD is conducting and sponsoring a number of studies on POF:

- Some researchers are exploring whether a low dose of a certain steroid can treat POF in cases caused by an autoimmune disorder. The steroid, called prednisone, decreases the function of the body's immune system, which is thought to be attacking the ovary follicles in some women with POF.
- Researchers are trying to determine the best combination and dosage of HRT for treating POF. Some work is trying to learn whether adding testosterone to a woman's HRT can help to prevent bone loss. Other studies are trying to find the amount of estrogen and progestin that best treats POF without causing too many side effects.
- Other research focuses on what happens in an ovary that is working normally. This information may help scientists develop a test for early detection of POF.

Clinical trials to explore these topics are already underway. To find out more about these studies, contact the NICHD's Unit on Gynecologic Endocrinology, at **1-877-206-0911**. You can also learn more about all studies on POF by going to http://clinicaltrials.gov, and doing a search for "premature ovarian failure." Or, you can call the NIH Patient Recruitment and Public Liaison Office at **1-800-411-1222**.

In addition to these studies, the NICHD has a Reproductive Medicine Gynecology Program in its Reproductive Sciences Branch that supports research on women's health conditions that aren't cancerous, including POF. In 1998, the NICHD joined other Institutes at the NIH in setting up 12 Women's Reproductive Health Research Career Development Centers. These Centers support obstetricians and gynecologists in becoming researchers, so that they can study topics on women's health. Eight additional Centers, started in 1999, will allow this vital research to continue until scientists know the causes and treatments for POF and other reproductive diseases.

The NICHD's Reproductive Sciences Branch also has other programs that support research on POF, and on other topics that affect women's health. The Specialized Cooperative Centers Program in Reproductive Research (SCCPRR), established in the late 1990s, relies on multidisciplinary approaches to research on reproductive health topics. SCCPRR has a number of basic, translational, and clinical scientific studies in progress at 14 sites around the country that are aimed at finding the cause of POF, including genetics and the factors that cause follicle depletion and dysfunction.

Where can I go for more information about POF?

The **NICHD** supports and conducts research on topics related to the health of children, adults, families, and populations, including POF. The mission of the NICHD is to ensure that every person is born healthy and wanted, that women suffer no harmful effects from the reproductive process, and that all children have the chance to fulfill their potential for a healthy and productive life, free of disease or disability, and to ensure the health, well-being, independence, and productivity of all people through optimal rehabilitation. You can contact the NICHD at:

The NICHD Information Resource Center
Phone: 1-800-370-2943 (TTY: 1-888-320-6942)
Mail: P.O. Box 3006, Rockville, MD 20847
Fax: (301) 984-1473
E-mail: NICHDInformationResourceCenter@mail.nih.gov
Internet: http://www.nichd.nih.gov

Additional Resources

- **The NIH Women's Health Initiative** is a series of clinical trials and observational studies that spans 15 years. The Initiative is designed to test promising, but unproven measures for preventing health conditions such as heart disease, breast cancer, and osteoporosis. The National Heart, Lung, and Blood Institute (NHLBI) sponsors the Initiative, in collaboration with the National Cancer Institute, the National Institute of Arthritis and Musculoskeletal and Skin Diseases, the National Institute of Aging, and the NIH Office of Research on Women's Health. For more information, visit the Initiative's Web site at **http://www.whi.org.**
- The NHLBI provides information about heart disease and lowering your risk for heart disease. To learn more, call the Heart Health information line at **1-800-575-WELL.** You can also contact the NHLBI Information Center at 301-592-8573 (for TTY call 240-629-3255), or at NHLBIinfo@rover.nhlbi.nih.gov.
- To obtain a copy of the CDC report, Assisted Reproductive Technology Success Rates, call 770-488-5200, or visit **http://www.cdc.gov/nccdphp/drh/art.htm.**
- For more information about clinical trials related to POF, call **1-800-411-1222**, or visit the NIH Clinical Trials Web site, at **http://clinicaltrials.gov.**
- For additional information about adoption, visit the National Library of Medicine's Web site, at **http://www.nlm.nih.gov/medlineplus/adoption.html.**

A number of other organizations provide information about POF and offer support to women and families affected by this disease.

- The **POF Support Group** is a non-profit organization that offers a referral list of physicians, mental health professionals and counselors, adoption agencies, and other professionals for women and families affected by POF. This group also publishes a quarterly newsletter and holds local and/or regional support group meetings. You can contact the POF Support Group at:

  POF Support Group
  Mail: P.O. Box 23643, Alexandria, VA 22304
  Phone: (703) 913-4787
  E-mail: info@pofsupport.org
  Internet: **http://www.pofsupport.org**

- **RESOLVE:** The National Infertility Association is a non-profit organization that provides timely, compassionate support and information to women and men who are affected by infertility. RESOLVE works to increase awareness of and access to infertility treatment and resolution options through public education and advocacy for legislative and insurance reform. Through a nationwide network of chapters, RESOLVE offers a number of benefits, including a HelpLine for finding fertility specialists and other referrals, a Member-to-Member contact system, a national magazine, and local chapter newsletters. You can contact RESOLVE at:

  RESOLVE
  Mail: 1310 Broadway, Somerville, MA 02144
  Phone: 1-888-623-0744
  E-mail: info@resolve.org
  Internet: **http://www.resolve.org**

- The **Child Welfare Information Gateway** is an all-inclusive resource on protecting children and stregthening families, including adoption information. The Gateway is a service of the Children's Bureau within the Administration for Children and Families (ACF), part of the federal government's Department of Health and Human Services. Gateway services include technical assistance, a library collection, publications, databases on adoption resources, and information on federal and state legislation related to adoption. You can contact the Gateway at:

  Child Welfare Information Gateway
  Mail: 1250 Maryland Avenue, SW, 8th Floor, Washington, DC 20024
  Phone: 1-888-394-3366 or (703) 385-7565
  Fax: (703) 385-3206
  E-mail: info@childwelfare.gov
  Internet: **http://www.childwelfare.gov/adoption/index.cfm**

- The **American Society of Reproductive Medicine (ASRM)** is an organization devoted to advancing knowledge and expertise in reproductive medicine and biology. For more information, contact:

  American Society of Reproductive Medicine
  Mail: 1209 Montgomery Highway, Birmingham, AL 35216-2809
  Phone: (205) 978-5000
  Fax: (205) 978-5005
  E-mail: asrm@asrm.org
  Internet: **http://www.asrm.org**

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