

AMERICAN SOCIETY FOR REPRODUCTIVE MEDICINE

UTERINE FIBROIDS

A Guide for Patients



PATIENT INFORMATION SERIES

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

INTRODUCTION

The *uterus* is a hollow pear-shaped organ, composed primarily of muscular tissue, which occupies a position in your pelvis between your bladder and rectum. The larger, upper portion of the uterus is called the corpus or body, and the smaller, lower segment, which protrudes into the vagina, the *cervix*. *Uterine fibroids* (also called *myomas* or *leiomyomas*) are benign (non-cancerous) tumors of muscle tissue that can enlarge and/or distort the uterus and sometimes the cervix. They originate from the smooth muscle cells within the *myometrium* or wall of the uterus.

Although occasionally solitary, fibroids are usually present as multiple tumors.

It is estimated that uterine fibroids occur in one out of every four American women. African Americans are three times more likely to have fibroids than Caucasians. Fibroids usually become noticeable during a women's reproductive years, and become smaller after menopause. Most cause no symptoms and do not require treatment. However, depending on their size and location in the uterus, they may become symptomatic and require treatment.

CAUSES

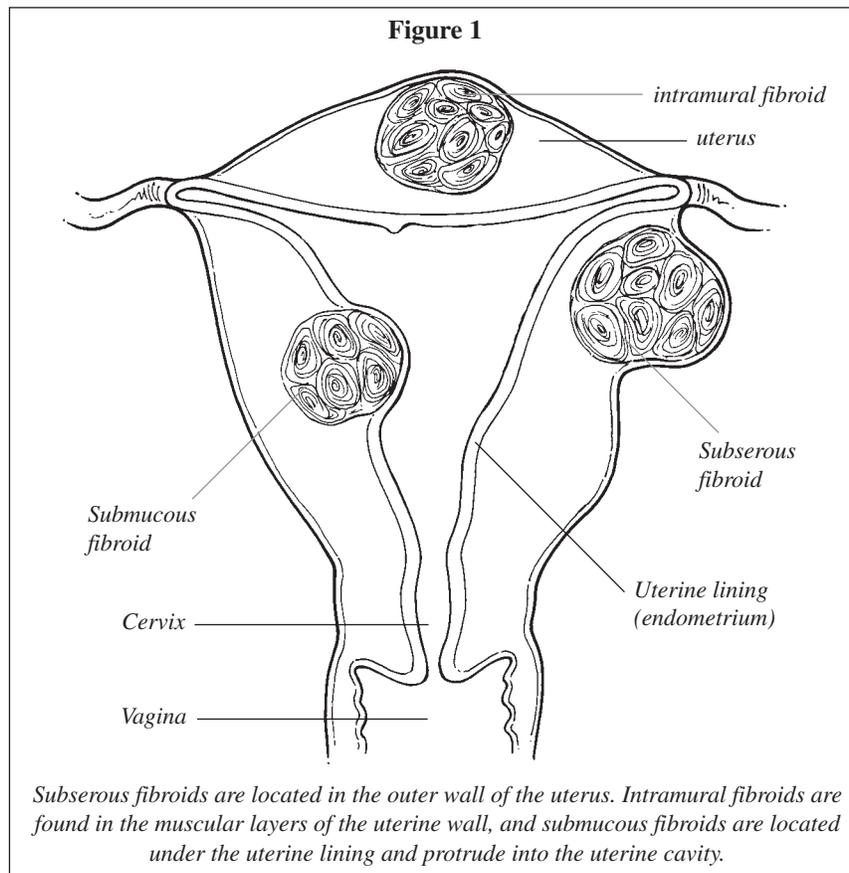
Increased Estrogen Levels

Fibroids arise when a single muscle cell in the uterine wall multiplies rapidly to form a tumor. The exact cause of uterine fibroids is unclear, but there is evidence that they require *estrogen* for growth. Fibroids may grow during pregnancy, a high estrogen state. After menopause, when estrogen levels decline, fibroids rarely grow and frequently shrink. Consequently, at this stage in a woman's life, treatment is not usually necessary. The growth and development of fibroids may also be influenced by other factors, such as *progesterone*. It is likely that fibroids have a genetic basis.

There is no evidence that any nutritional or lifestyle factors affect fibroid growth and development. Similarly, medications such as low-dose birth control pills have little or no impact on fibroid growth.

TYPES OF FIBROIDS

Fibroids are usually found in or around the body of the uterus, but sometimes occur in the cervix. Fibroids can be divided into three categories: *subserous* located in the outer wall of the uterus; *intramural* found in the muscular layers of the uterine wall; and *submucous* which protrude into the uterine cavity (Figure 1). About 55% of fibroids are subserosal; 40% are intramural; and 5% are submucosal.



SYMPTOMS

Symptoms from fibroids are related to their size and location. Many women with uterine fibroids have no symptoms. Approximately one-third of women will experience abnormal uterine bleeding, pain, or pressure in the lower abdomen. Some women will notice a mass which can occasionally be as large as a full-term pregnancy.

Abnormal Uterine Bleeding

Abnormal uterine bleeding is the most common symptom associated with fibroids and is the main reason why women require treatment. Intramural and submucosal fibroids can distort or enlarge the uterine cavity, creating a larger surface area for menstrual bleeding. Pressure from submucous fibroids on the *endometrium* can cause excessive bleeding. Because abnormal uterine bleeding can result from other causes, such as endometrial cancer and hormonal problems, it is important that women with fibroids who experience abnormal vaginal bleeding receive a thorough evaluation for other causes of bleeding.

Pain

A rapidly enlarging fibroid may outgrow its blood supply and *degenerate*, causing pain and cramping. This happens most often during pregnancy. Fibroids which are attached to the uterus by a thin stalk may twist and cause severe pain. Large and bulky uterine fibroids may also make sexual intercourse uncomfortable. Women with fibroids may also experience painful menstrual cramps.

Pressure Symptoms

Large fibroids may press on nearby pelvic organs. If the fibroid exerts pressure on the *bladder*, which lies in front of the uterus, urinary frequency or urgency may occur. Pressure on the *ureters*, which bring urine from the kidneys to the bladder, can result in kidney damage if the fibroids are not removed. Fibroids in the lower uterus may put pressure on the large bowel and *rectum*, which could cause painful bowel movements, constipation, or *hemorrhoids*.

FIBROIDS AND INFERTILITY

Although uterine fibroids are common, only about 3% of infertility is caused by fibroids. In such cases the fibroids are usually submucosal or intramural. Infertile women and their partners should have a thorough investigation to identify other causes of infertility.

There are several explanations for why uterine fibroids may reduce fertility. Changes in the endometrium may make it difficult for a fertilized egg to attach to the uterine wall. In addition, one or both *fallopian tubes* may be compressed and blocked, preventing the sperm from reaching the egg. Fibroids may increase miscarriage rates by impairing successful implantation of an embryo. Changes in the endometrium or in the blood supply to the uterus may also cause early miscarriage. Fibroids can cause early labor and premature delivery.

CANCER AND FIBROIDS

Cancer arising from uterine fibroids is called *leiomyosarcoma*. The overall risk of fibroids being cancerous (malignant) is approximately one in 1,000 in

the reproductive years and is more common in postmenopausal women. A fibroid that grows after menopause may be a leiomyosarcoma, in which case removal of the uterus (*hysterectomy*) is required.

DIAGNOSIS

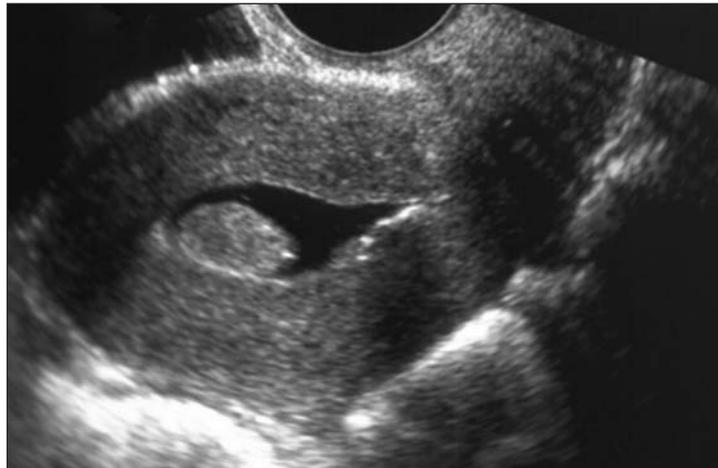
Uterine fibroids are often diagnosed by pelvic exam. Other diagnostic procedures may be utilized to determine the presence, location, and size of fibroids and to check for other conditions, such as ovarian tumors or bowel masses. In some cases, diagnostic tests may be helpful in determining the best treatment.

Ultrasound

Ultrasound uses the echos from high frequency sound waves to create a picture of the pelvic organs. As fibroids vary in size and location, both transvaginal and transabdominal ultrasounds may be utilized to optimally visualize the fibroids.

Sonohysterography

Sonohysterography is an ultrasound procedure in which your uterine cavity is outlined by a small amount of fluid. The fluid is placed in the uterus through a thin, plastic tube. You may experience mild cramping. Sonohysterography improves the physician's ability to identify fibroids which protrude into or distort the uterine cavity.



Sonohysterography showing a fibroid extending into the uterine cavity.

Hysterosalpingography

Hysterosalpingography (HSG) is a procedure that produces an x-ray image of the inside of your uterus and determines if the fallopian tubes are open. A fluid that contains iodine is injected through the cervix into the uterus and fallopian tubes, and an x-ray is obtained. Uterine cramping may be experienced. You should inform your doctor if you are sensitive to iodine or shellfish. Please refer to ASRM's Patient Fact Sheet *Hysterosalpingogram* for more information.

Computerized Tomography

Computerized tomography (CT) is a type of x-ray procedure that uses a computer to construct an image of a body structure such as the uterus. Although rarely needed, this image can determine if fibroids are present.

Magnetic Resonance Imaging

Magnetic resonance imaging (MRI) produces a picture by absorbing energy from specific, high-frequency radio waves which can determine if fibroids are present. An MRI is not routinely needed to diagnose fibroids but may help clarify the diagnosis in some circumstances.

Diagnostic Hysteroscopy

Diagnostic hysteroscopy is useful to determine the presence of submucosal fibroids. This procedure involves the insertion of a telescope-like instrument called a *hysteroscope* through the vagina and cervix into the uterine cavity to look for abnormalities within the uterine cavity. If this procedure is performed in an operating room, a submucosal fibroid may be removed. This procedure is described later in this booklet. For more information on hysteroscopy, please refer to the ASRM Patient Information booklet titled *Laparoscopy and Hysteroscopy*.

TREATMENT

Periodic Assessment

Fibroids usually do not require treatment. Periodic assessments are generally sufficient to determine whether fibroids are changing in size or if you are developing symptoms that would require treatment. Periodic assessment is especially important if you are planning pregnancy.

Medical Management of Fibroids

GnRH analogs are medicines that are given by injection or nasal spray to temporarily reduce the size of fibroids by lowering ovarian estrogen production. When therapy is discontinued, the fibroids return to their pretreatment size within three months to six months. GnRH analogs produce menopausal-like side effects such as hot flashes, vaginal dryness, mood swings, and sometimes bone loss.

These medications cannot be used for extended periods of time unless special precautions are taken to prevent bone loss. In women who have experienced excessive menstrual bleeding and have become anemic, GnRH analogs may decrease vaginal bleeding. This medication, in combination with iron supplements, may improve anemia prior to surgery, allowing for the possibility of banking blood prior to surgery.

Hormonal therapies such as birth control pills and *progestins* may be used to help control abnormal uterine bleeding associated with fibroids, but do not affect their size. Alternative approaches such as herbal and homeopathic therapies have not been shown to improve symptoms caused by fibroids. Although iron therapy may improve anemia, other nutritional modifications are not of proven benefit. None of these approaches can be considered a primary treatment for uterine fibroids at present. Research continues to evaluate other medical therapies.

Surgical Management of Fibroids

There are a variety of surgery options available to treat uterine fibroids. If you are experiencing infertility, surgery to remove the fibroids should be considered only after a thorough evaluation of other factors which could be causing infertility.

Myomectomy (Surgical Removal of Fibroids)

Fibroids that cause significant symptoms may require surgery. Removal of only the fibroids, rather than the entire uterus, is called a *myomectomy*. Myomectomy is most often performed in women who desire future pregnancy or avoid hysterectomy. Today, there are several options available for myomectomy. In most cases, the size and location of the fibroids will determine the appropriate surgical technique. Some fibroids may be removed through hysteroscopy or laparoscopy procedures, but large, multiple, or inaccessible fibroids usually require *laparotomy*. Conception rates after any of the surgical techniques used to remove fibroids are generally good but depend upon other factors that influence fertility such as age, previous pregnancy, ovulatory status, the condition of the fallopian tubes, and the male's semen quality.

Abdominal Myomectomy (Laparotomy)

During a laparotomy, the physician makes an incision in the abdominal wall to remove the fibroids from the uterus. It usually takes about four weeks to six weeks for a complete recovery. If the myomectomy is extensive, a future pregnancy may require a Cesarean section to reduce the risk of uterine rupture during labor.

The two major risks of a myomectomy are excessive blood loss and adhesions (scar tissue) that may impair future fertility. Rarely, a hysterectomy may be required to control hemorrhage. If you and your physician decide that myomectomy is the best option, there are other risk factors that need to be discussed. For example, there is a chance that new fibroids will develop and require further surgery. Pelvic adhesions may form which can impair fertility by affecting the tubes or *ovaries*.

Hysteroscopic Myomectomy

Submucosal fibroids located mainly within the uterine cavity may be removed with *operative hysteroscopy*. During this procedure, the physician inserts a hysteroscope through the cervix and fills the uterus with fluid to expand the walls. Surgical instruments are then inserted through a channel in the hysteroscope to remove submucous fibroids. Generally, women can return to their normal activities within two days after operative hysteroscopy. Serious complications are uncommon and include damage or scarring to the uterus, *electrolyte imbalance*, and bleeding. Please refer to the ASRM Patient Information booklet titled *Laparoscopy and Hysteroscopy* for more information.

Laparoscopic Myomectomy

In some cases, *operative laparoscopy* may be used to remove the fibroids. During operative laparoscopy, the physician places a *laparoscope* into the abdomen through a small incision near the navel and then uses surgical instruments to remove the fibroids. Recovery time is usually two to seven days. Risks associated with operative laparoscopy include adhesions, trauma to internal organs, and hemorrhage. Women who undergo this procedure for intramural fibroids have an increased risk of uterine rupture in subsequent pregnancies. Until more information is available, this approach should not be considered standard procedure for women who wish to maintain their fertility.

Uterine Artery Embolization

Uterine artery embolization is a procedure performed by a radiologist and involves injecting small particles into the uterine blood vessels. These particles clog the small blood vessels that supply the fibroids, cutting down the blood supply and causing the fibroids to degenerate. Patients generally experience several days of pain after the procedure. Fibroid volume shrinks by 40% to 50%, and the majority of patients experience symptomatic relief. Since the procedure has only been available since the early 1990s, information concerning its long-term benefits and risks is limited. At this time, little is known about the effect of uterine artery embolization on future fertility and pregnancy.

Hysterectomy

Approximately half of all hysterectomies are performed to treat uterine fibroids. If you have symptomatic fibroids, and future pregnancy is not desired, a *hysterectomy* or surgical removal of the uterus may be recommended. There are three ways to perform a hysterectomy: abdominally, vaginally, and in some cases laparoscopically. Recovery time is usually two to six weeks. It is important to discuss the potential after-effects of hysterectomy, such as issues relating to sexuality, psychological impact, and medical consequences with your physician. If your ovaries are removed at the time of hysterectomy, it is also important to discuss issues relating to menopause.

Alternative Procedures

Other new techniques including cryomyolysis, myoma coagulation, and endometrial ablation of fibroids have been reported without any significant evaluation of risks and outcome. Until more information is available, these approaches should not be considered standard treatment for women who wish to maintain their fertility.

PSYCHOLOGICAL ASPECTS

If you have experienced infertility or a miscarriage because of fibroids, you may feel a variety of negative emotions. If you are faced with the possibility of losing your uterus, you may feel angry and sad, especially if future pregnancy is desired. It is important for you to discuss these feelings with your physician so that alternatives to hysterectomy, if possible, can be discussed and considered. It is also helpful to seek support from family, friends, and support groups.

SUMMARY

Uterine fibroids are benign smooth muscle tumors in or around the uterine wall. They are commonly found in women during their reproductive years. Fibroids are usually harmless, but in some women may cause abnormal uterine bleeding, pain, pressure, miscarriage, or infertility. There is an extremely small chance that fibroids can develop into cancer. Therefore, it is important that you see your doctor at regular intervals if you are diagnosed with uterine fibroids to decide if therapy is advisable.

Let Us Know What You Think

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

GLOSSARY

Bladder. A bag-like structure located in the lower abdomen that holds urine flowing from the kidneys.

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

Computerized tomography (CT). An x-ray imaging technique that creates a three-dimensional image of internal organs.

Degenerate. A condition of breakdown or decay, such as when a fibroid outgrows its blood supply, begins to deteriorate, and changes in size.

Diagnostic hysteroscopy. The insertion of a long, thin, lighted telescope-like instrument, called a hysteroscope, through the vagina, cervix, and into the uterus in order to look inside the uterine cavity.

Diagnostic laparoscopy. The insertion of a long, thin, lighted telescope-like instrument, called a laparoscope, through the navel into the abdomen in order to look at the internal pelvic organs, such as the uterus, ovaries, and fallopian tubes.

Electrolyte imbalance. A decrease in levels of sodium potassium and/or chloride.

Endometrium. The lining of the uterus that is shed each month with the menstrual period. As the monthly cycle progresses, the endometrium thickens and thus provides a nourishing site for the implantation of a fertilized egg.

Estrogen. The female sex hormones produced by the ovaries which are responsible for the development of female sex characteristics. Estrogens are largely responsible for stimulating the uterine lining to thicken during the first half of the menstrual cycle in preparation for ovulation and possible pregnancy. They are also important for healthy bones and overall health. A small amount of these hormones is also produced in the male when testosterone is converted to estrogen.

Fallopian tubes. A pair of hollow tubes attached one on each side of the uterus through which the egg travels from the ovary to the uterus. Fertilization usually occurs in the fallopian tube. The fallopian tube is the most common site of ectopic pregnancy.

GnRH analogs. Long-acting drugs that block the release of hormones, stop ovulation, and decrease the body's production of estrogen. Prolonged use of GnRH analogs causes decreased hormone production and menopausal levels of estrogen. Some brand names include Lupron®, Depo Lupron®, Synarel®, and Zolodex®.

Hemorrhoids. A painful swelling of a vein in the anal region often accompanied by bleeding.

Hysterectomy. The surgical removal of the uterus. Hysterectomy may be performed through an abdominal incision (laparotomy), through the vagina (*vaginal hysterectomy*), or through laparoscopy assisted vaginal hysterectomy (LAVH). Sometimes the ovaries and fallopian tubes are also removed.

Hysteroscope. A thin, lighted, telescope-like instrument which is inserted through the vagina and cervix into the uterine cavity to allow viewing of the inside of the uterus.

Hysterosalpingography (HSG). An x-ray procedure in which a special iodine-containing solution is injected through the cervix into the uterine cavity to illustrate the inner shape of the uterus and degree of openness (patency) of the fallopian tubes.

Intramural fibroids. Fibroids located in the muscular wall of the uterus.

Laparoscope. A thin, lighted, telescope-like viewing instrument that is usually inserted through the navel into the abdomen to examine the contents of the pelvic and abdominal cavities. Other small incisions may also be made and additional instruments inserted to facilitate diagnosis and allow surgical correction of pelvic abnormalities. The laparoscope can be used as both a diagnostic and operative instrument.

Laparotomy. Major abdominal surgery through an incision in the abdominal wall.

Leiomyoma. Benign (non-cancerous) tumors of the uterine muscle wall that can cause abnormal uterine bleeding. Also called fibroids or myomas.

Leiomyosarcoma. A malignant tumor arising from smooth muscle tissue such as the uterus.

Magnetic resonance imaging (MRI). A diagnostic procedure that absorbs energy from specific high-frequency radio waves. The picture produced by measurement of these waves can be used to form precise images of internal organs without the use of x-ray techniques.

Myoma. Benign (non-cancerous) tumors of the uterine muscle wall that can cause abnormal uterine bleeding and miscarriage. Also see fibroids or leiomyomas.

Myomectomy. The surgical removal of myomas (fibroids) from the uterus.

Myometrium. The muscular wall of the uterus.

Operative hysteroscopy. Surgery, such as removal of adhesions or tumors, performed inside the uterus using a hysteroscope.

Operative laparoscopy. Surgery, such as removal of adhesions or endometriosis, performed inside the abdomen with a laparoscope and other long, slender instruments. The surgeon can sometimes cut and remove scar tissue and open closed fallopian tubes during this procedure.

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

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

Progestins. A synthetic hormone that has an action similar to progesterone. Synonymous with progestational hormones.

Rectum. The lowest segment of the intestines attached to the anus.

Sonohysterography. A technique which involves injecting a fluid (saline solution) into the uterine cavity through the cervix while simultaneously using ultrasound to observe the image on a monitor screen. Also known as hysterosonogram.

Submucous fibroids. Fibroids that are found underneath the uterine lining within the uterine cavity.

Subserous fibroids. Fibroids that are located beneath the outer covering of the uterus.

Ultrasound. A picture of internal organs produced by high frequency sound waves viewed as an image on a video screen; used to monitor growth of ovarian follicles or a fetus and to retrieve eggs. Ultrasound can be either performed abdominally or vaginally.

Ureters. The tubes that carry urine from the kidneys to the bladder.

Uterine fibroids. Abnormal masses of smooth muscle tissue (non-cancerous tumors) that grow within the uterine wall. Also called fibroids, myomas, or leiomyomas.

Uterine artery embolization. A surgical procedure whereby a slurry of microscopic plastic beads is injected into the blood supply of the uterus, resulting in degeneration and shrinkage of the fibroids.

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

Vaginal hysterectomy. Removal of the uterus through the vagina.

For a list of additional reading materials, contact the ASRM administrative office at 1209 Montgomery Highway, Birmingham, Alabama 35216-2809; (205) 978-5000.

NOTES

Booklets available for purchase through the
American Society for Reproductive Medicine Patient Information Series:

- ___ *Abnormal Uterine Bleeding (1996)*
- ___ *Adoption (1996)*
- ___ *Age and Fertility (2003)*
- ___ *Assisted Reproductive Technologies (2003)*
- ___ *Birth Defects of the Female Reproductive System (1993)*
- ___ *Donor Insemination (1996)*
- ___ *Ectopic Pregnancy (1996)*
- ___ *Endometriosis (1995)*
- ___ *Endometriosis (Spanish Translation) (2003)*
- ___ *Fertility After Cancer Treatment (1995)*
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- ___ *Husband Insemination (1995)*
- ___ *Infertility: An Overview (2003)*
- ___ *Infertility: An Overview (Spanish Translation) (1996)*
- ___ *Infertility: Coping and Decision Making (1995)*
- ___ *Laparoscopy and Hysteroscopy (1995)*
- ___ *Male Infertility and Vasectomy Reversal (1995)*
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- ___ *Pelvic Pain (1997)*
- ___ *Pregnancy After Infertility (1997)*
- ___ *Premenstrual Syndrome (PMS) (1997)*
- ___ *Third Party Reproduction (Donor Eggs, Donor Sperm, Donor Embryos,
& Surrogacy) (1996)*
- ___ *Tubal Factor Infertility (1995)*
- ___ *Unexplained Infertility (1998)*
- ___ *Uterine Fibroids (2003)*

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