

Understanding your menstrual cycle

The term 'menstrual cycle' refers to the changes that occur naturally in a woman's body to prepare it for pregnancy.

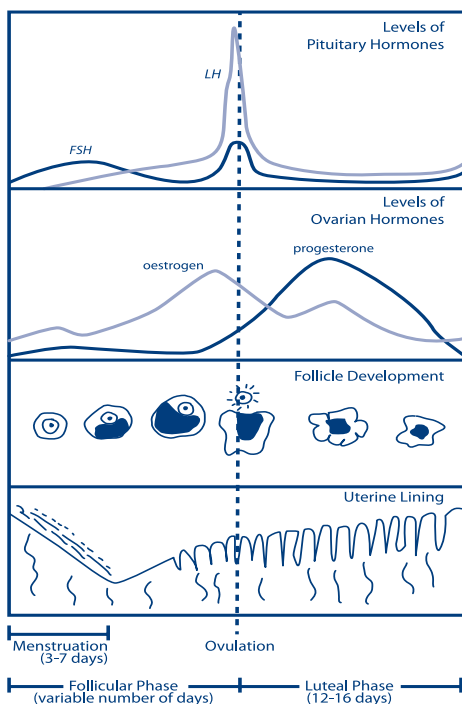
In a normal menstrual cycle, women experience menstruation (also known as a period) followed by the release of an egg. During menstruation blood, cells and mucus are discharged from the uterus.

The menstrual cycle starts on the first day of the menstrual period (referred to as day one) and ends the day before the next period begins. While the length of the menstrual cycle is often 28 days, it can vary between women and from one cycle to the next. It is common for women to experience cycles that last anywhere from 20 to 40 days. Cycles longer than six weeks are considered unusual.

The length of a woman's menstrual cycle can change throughout her life. Irregular periods are common among adolescent women, and in women approaching menopause. Factors such as stress, extreme emotion (good or bad), weight changes, excessive physical activity and travelling can also cause irregularities in a woman's menstrual cycle.

Phases of the menstrual cycle

The menstrual cycle has four distinct phases: menstruation, the follicular phase, ovulation, and the luteal phase.



Although menstruation is considered to be the first phase of the cycle, in order to properly understand menstruation, it is necessary to first explain the other phases.

THE FOLLICULAR PHASE

During this phase, the pituitary gland releases follicle-stimulating hormone (FSH), which causes between 10 and 20 follicles (cells that contain immature eggs, known as ova) to begin developing in the ovary. They produce the hormone oestrogen, which causes the lining of the uterus (endometrium) to become thick in preparation for the possible embedding of a fertilised egg.

Usually only one follicle develops into a mature egg. This follicle moves towards the surface of the ovary, while the others break down and are reabsorbed by the body. The follicular phase begins on the first day of menstruation and ends with ovulation. It can vary considerably in length, depending on the time of ovulation.

OVULATION

The term 'ovulation' refers to the release of a mature egg from the ovary. During the follicular phase, the rise in a woman's oestrogen levels causes gonadotropin-releasing hormone (GnRH) to be released from her brain. This in turn causes the pituitary gland to produce increased levels of luteinising hormone (LH). The abrupt rise in LH, known as the LH surge, triggers ovulation. Following ovulation, the egg is swept into the fallopian tube and moved along towards the uterus. If fertilisation does not occur, the egg disintegrates within 6-24 hours.

Cervical mucus and position

Just before ovulation, a woman's cervical mucus becomes clear and slippery, resembling raw egg white; it is very elastic and can be stretched into a string between two fingers. This kind of cervical mucus is known as 'fertile mucus' because a woman is considered fertile when it is present. Fertile mucus assists and nourishes sperm as they travel up the vagina towards the opening of the cervix.

When a woman is in a non-fertile phase of her cycle, her cervical mucus differs in colour and texture. It might be sticky, crumbly, gummy or creamy (like lotion) in texture, and white, milky or yellow in colour. This mucus cannot be stretched between the fingers and may have a sour smell. It is important to note that secretions related to sexual arousal, semen, lubricants, spermicides, vaginal infections (e.g. thrush), and certain medications can all interfere with the appearance of cervical mucus.

The positioning of the cervix and its opening also change throughout a woman's cycle. At about the time of ovulation, the cervix moves into a higher position and its opening widens. Some women may experience aches or pain around the time of ovulation. This pain can vary from cramps or a general ache in the abdomen to sharp pains in one side. Spotting (light bleeding) can also occur at this time.

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Time of ovulation

Women often believe that ovulation occurs mid-cycle. It actually occurs 12-16 days before the next period starts. So, although a woman with a 28-day cycle may ovulate mid-cycle (between day 12 and day 16), a woman with a 36-day cycle will ovulate between day 20 and day 24.

For women with regular cycles, an easy way to approximate the time of ovulation is to subtract 16 from the number of days in the cycle and then add 4. This will calculate the span of days in which ovulation is most likely to occur. For instance, a woman with a 22-day cycle is most likely to ovulate between days 6 and 10 of her cycle ($22-16 = 6$ ($+4 = 10$)).

Ovulation and conception

Following ovulation, the egg's lifespan can be up to 24 hours, but is usually between six and 12 hours. In contrast, sperm generally survive for three days, but can live inside the vagina for up to five days if optimal fertile cervical mucus is present. Pregnancy can therefore result from intercourse that occurs within a woman's fertile window (from as early as five days before ovulation, until up to 24 hours following ovulation).

THE LUTEAL PHASE

During this phase, the remnants of the follicle that released the egg (now called the corpus luteum) release large amounts of the hormone progesterone as well as some oestrogen. These hormones contribute to the further thickening and maintenance of the uterine lining. If fertilisation does not occur, the corpus luteum breaks down and progesterone levels decline, leading to the disintegration of the uterus lining. During the luteal phase, women may experience physical and emotional changes including tender or lumpy breasts, fluid retention, bloating, mood swings, tiredness or anxiety (see *Premenstrual syndrome*).

MENSTRUATION

Menstruation occurs when the broken-down lining of the uterus flows out through the vagina. Menstruation generally lasts from three to seven days. Some women regularly have periods that are shorter or longer than this. The length can also differ from one cycle to the next. In addition to blood, menstrual fluid is made up of several components including endometrial cells, cervical mucus and vaginal secretions. The amount of menstrual fluid lost varies between women and from one cycle to the next, but a woman generally loses about 50-100ml of fluid each time she has a period.

Menstrual flow may be heaviest or lightest at the beginning of menstruation or may change throughout. The colour can range between black, brown, dark red, bright red and pink. Menstrual fluid only tends to have an unpleasant odour after it has been in contact with air for a period of time.

Age of first and last period (menarche and menopause)

In Australia, menarche (the onset of menstruation) occurs most often in girls aged from 11 to 14. Menarche usually occurs a year or two following the appearance of other puberty related changes, such as breast development and pubic/underarm hair growth. Genetic factors and social influences, as well as a girl's ethnicity, size, and weight, can influence when menarche occurs. Girls with a higher body mass index (BMI) are likely to begin getting periods earlier than those with lower BMI scores. Girls who are highly physically active (such as athletes) tend to have slightly delayed menarche.

Research suggests that the average age of menarche has fallen during the last century. This can be attributed to a number of factors including improved diet, better healthcare and possibly the increase in oestrogen-like substances in the environment (e.g., pesticides and plastics). Recent studies suggest that the age of menarche is often slightly reduced in girls who are subject to emotional stressors, such as family disruption or childhood adversity, and in girls who consumed high intakes of animal proteins, such as cow's milk, during childhood.

It is recommended that if a young woman has not had her period by the time she is 16, she should consult a doctor to ensure that she does not have a medical condition that is preventing menstruation from occurring.

When young women first start menstruating, they are often anovulatory (not ovulating) and, therefore, not fertile. However, it is important for sexually active young women to remember that as soon as they start menstruating, pregnancy can occur. Therefore, they should use contraception if they wish to avoid becoming pregnant.

Menstruation without ovulation can also occur at other life stages, such as before menopause. Menopause, the ending of periods, typically occurs in women who are in their late 40s or early 50s. In the time leading up to menopause, the menstrual cycle and/or flow may change, becoming lighter, heavier or longer. While irregular bleeding is also common at this time, it can be a symptom of gynaecological cancer so women experiencing this should consult their doctor. Even though women may be unsure as to whether they are ovulating prior to menopause, contraception still needs to be used if pregnancy wants to be avoided.

Sex and menstruation

Some women avoid sexual activity when they have their period for personal, cultural or religious reasons. However, there are few physical reasons why women should avoid sex during menstruation. One consideration is that the risk of transmitting blood-borne infections such as hepatitis C and HIV is higher when having unprotected sex at this time. It is possible for pregnancy to occur if women have unprotected sex during menstruation. Women who want to avoid pregnancy should use contraception at this time.

The Pill and menstruation

The Pill contains synthetic oestrogen to prevent the development of an egg (and therefore, ovulation), and synthetic progesterone to increase the thickness of cervical mucus (to slow the movement of sperm) and prevent the complete development of the uterine lining.

Because women on the Pill do not ovulate, they do not experience changes in cervical mucus or ovulation pain. Their 'period' is actually a withdrawal bleed resulting from the stopping of the synthetic hormones (during the seven days of inactive/sugar pills) rather than a natural menstruation.

Women taking the Pill can use it to miss or delay a withdrawal bleed. This can be convenient for women planning travel or special occasions. Women who experience health problems such as endometriosis, menstrual migraine and heavy bleeding may use the Pill to reduce the number of withdrawal bleeds they have a year (and, therefore, the number of times they experience symptoms). Women taking a monophasic Pill (a version of the Pill that delivers the same dosage throughout the cycle) can miss or delay a withdrawal bleed by simply missing the inactive/sugar pills and going straight on to the next pill packet. However, women on a triphasic Pill (a version of the Pill that delivers different dosages throughout the cycle) may experience spotting if they do this, due to the change in hormone levels at the start and end of the pill packet. Women on triphasic Pills who wish to miss a withdrawal bleed should seek advice from their doctor.

Breakthrough bleeding can sometimes occur in women on the Pill, particularly in the first few months of taking it or if the woman is using a triphasic Pill. A woman is still covered contraceptively if she has not missed any active pills and has a breakthrough bleed. However, she should consult her doctor to review the choice of Pill and to ensure the bleeding is not related to another condition (see *Bleeding between periods* section).

Return of periods after childbirth

The length of time before a woman's period returns following pregnancy largely depends on whether she is breastfeeding or not. This is because the hormone that stimulates milk production, prolactin, also inhibits ovulation and the return of menstruation. Therefore, women who are fully breastfeeding may not have a period for several months after childbirth or until they finish breastfeeding. The return of menstruation in breastfeeding mothers depends upon the frequency and duration of breastfeeds a day.

In women who are not breastfeeding, and women who are combining breastfeeding with bottle feeding, menstruation can return as soon as five-to-six weeks following childbirth. It is important to be aware that women will ovulate, and therefore be fertile, before the return of their first period following delivery/breastfeeding. It is also important to note that even though breastfeeding can delay the return of periods, it is not a reliable form of contraception.

Sanitary protection

PADS

Sanitary pads come in a variety of shapes and thicknesses to suit different flow types and situations (e.g., night-time pads). Pads generally need to be changed every three to four hours and should be wrapped and disposed of in a bin. They cannot be flushed down the toilet as they will block the plumbing. Reusable cloth pads can be used as an alternative to disposable pads.

TAMPONS

Tampons are preferred by many women because they are comfortable to wear and convenient to use. Tampons come in various sizes to suit different menstrual flows. Women should choose the minimum possible absorbency to suit their flow. For example, if flow is light, women should choose a mini tampon, rather than a super tampon. Tampons need to be changed every three to four hours.

Some women worry that a tampon will get lost inside them. This is not physically possible because the entrance to the uterus (the cervical opening) is so small that a tampon cannot enter it. Tampons do occasionally become stuck in the vagina. If this happens, adopting a squatting position or sitting in a warm bath can help women remove the tampon. If this fails, a doctor can remove it.

Young women (and parents of young women) often ask whether tampons can be used by virgins. The answer is 'yes' because tampons do not break the hymen. The hymen is a collar of tissue attached to the vaginal walls, located just inside the vaginal opening. The hymen has a small opening, or gap, in it, which allows menstrual fluid to flow out. The increased oestrogen levels that occur during puberty cause the hymen to increase in thickness and elasticity, which means it can accommodate a tampon; it simply stretches out. For young women who are concerned that tampons may damage their hymen, it is worth noting that it is not possible to tell whether someone is a virgin by looking at their hymen. What is more, girls' hymens are often no longer intact by the time they get their first period, as a result of normal physical activity.

To make tampon insertion easier, first-time tampon users may wish to try a mini tampon, use some lubricant or saliva on the tampon, or use a tampon with an applicator. Once a tampon has been inserted correctly a woman should not be able to feel it.

Parents of girls new to using tampons may wish to remind their daughters to change their tampon regularly. Like pads, tampons should be disposed of in a bin rather than flushed down the toilet. This is particularly important in rural areas in Australia that often use septic systems.

MENSTRUAL CUPS

Menstrual cups are made of rubber or silicone and are worn inside the vagina to catch menstrual fluid. They can be worn during activities such as swimming; however, they cannot be worn during penetrative sex. In Australia they are not commonly used. They are classified as a medical device and must therefore be approved for sale by the Therapeutic Goods Administration. This means they are not commonly available in supermarkets and pharmacies, however they are widely available for purchase online. Menstrual cups come in different sizes. When selecting a size, women should consider factors such as their flow, their anatomy, the amount of physical activity they do, their age, and whether or not they have had children. It can take time and some trial-and-error for women to find a brand and size that is comfortable.

TOXIC SHOCK SYNDROME

Toxic shock syndrome (TSS) is a rare illness caused by the toxins that are released by a type of bacteria called *Staphylococcus aureus*. It is believed that using a tampon absorbency that is too high (for example, using a super tampon when flow is only light), or not changing a tampon for a long period of time, can cause the bacteria to rapidly multiply, releasing toxins into the bloodstream. Symptoms include a sudden high fever, a rash similar to sunburn, vomiting, diarrhoea, muscular pain and headache. TSS can also cause kidney and liver failure.

TSS is very rare. Women can reduce their already low risk of developing TSS by choosing the lowest absorbency tampon necessary (using a mini tampon during light flow, a regular tampon during medium flow and a super tampon only during heavy flow); by washing their hands thoroughly before and after inserting a tampon; by using pads overnight; and by changing their tampons at least every three to four hours.

Recent studies show that women who have had TSS in the past may carry a higher risk of developing the condition again. Women who have had TSS should avoid using tampons and menstrual cups.

DISABLED WOMEN

Women with disabilities that restrict their movement may find it difficult to use tampons or menstrual cups. Women with impaired hand function may find that using lubricant on a tampon can help with insertion. Women with limited lower body sensation who use sanitary pads need to regularly check for signs of skin irritation and pressure from their pad, and in order to avoid leakage, they should ensure that pads are well placed. Women may find thicker, larger pads, such as those designed for incontinence, easier to use.

Common menstrual problems

Some of the most commonly reported menstrual problems are an absence of periods, painful periods, heavy bleeding, bleeding between periods, and premenstrual syndrome (PMS).

ABSENCE OF PERIODS (AMENORRHOEA)

Outside of pregnancy, amenorrhoea is usually the result of hormonal disturbances. These disturbances can be caused by a wide range of factors including weight gain or loss (body weight and body fat percentage are directly related to menstruation), being chronically underweight, over-exercising, extreme emotion (both good and bad), anxiety or stress, travel, dietary changes, and conditions such as polycystic ovarian syndrome. Often, amenorrhoea is temporary, with menstrual periods returning in time. Women who are not pregnant and have not had a period for longer than six months should consult their doctor.

PAINFUL PERIODS (DYSMENORRHOEA)

While some women experience only mild discomfort when they have their period, other women suffer from severe, incapacitating pain. This kind of pain is not normal and women should consult their doctor if the pain they experience interferes with their ability to function normally.

Women might get pain a few days before their period or during the first few days of bleeding. The pain can be a cramping-type pain, caused by the contraction of the uterine muscles, or a heavy dragging pain in the pelvic region. Pain in the legs and back, headaches, nausea, constipation and diarrhoea are also common.

Period pain can be the result of prostaglandins, the substance that causes the uterus to contract during a period. Severe period pain might also signal the presence of conditions such as pelvic inflammatory disease or endometriosis. Popular remedies for mild pain include analgesics (aspirin or paracetamol), herbal medicines, warm baths, heat packs, gentle exercise and rest. Treatment for more severe period pain includes the use of antiprostaglandins (e.g., Nurofen, Ponstan) and oral contraceptives. If women do not find relief with these treatments they should consult their doctor.

HEAVY BLEEDING (MENORRHAGIA)

Because it is hard to measure the amount of menstrual fluid lost, it is difficult to define what constitutes heavy bleeding. However, the degree to which a woman's period interferes with her everyday life can provide a guide (e.g., having to change a pad or tampon every hour can indicate that bleeding is heavy).

Heavy bleeding can be caused by a number of factors including hormonal imbalances, fibroids, polyps, endometriosis, or, less commonly, bleeding disorders. Excessive blood loss through heavy periods can lead to anaemia. The Pill and/or antiprostaglandins can be used to treat heavy bleeding. Other treatment options include inserting a Mirena intra-uterine device (IUD), or undergoing endometrial ablation (a procedure that causes the destruction of the uterine lining)..

BLEEDING BETWEEN PERIODS

Bleeding or spotting between periods can be a symptom of a number of conditions including sexually transmitted infections, gynaecological cancer, endometriosis, fibroids or a thyroid disorder. It can also be a side effect of some contraceptives or medications (see *The Pill and menstruation* section). If a woman experiences bleeding between periods she should consult her doctor.

PREMENSTRUAL SYNDROME (PMS)

Premenstrual syndrome (PMS) refers to a number of symptoms some women experience before each period. Physical signs of PMS include tender or lumpy breasts, fluid retention, bloating, food cravings and

headaches. Psychological signs include mood swings, tiredness, and feelings of anxiety, anger, and sadness. Women who suffer from mild PMS might find exercise, dietary changes, yoga, relaxation techniques, and herbal remedies useful.

PREMENSTRUAL DYSPHORIC DISORDER (PMDD)

A small percentage of women suffer from a severe form of PMS called premenstrual dysphoric disorder (PMDD). Women with PMDD experience symptoms so severe that they greatly impact their everyday functioning. Treatments for PMDD include lifestyle changes, the Pill, cognitive behavioural therapy, and, if other treatments are unsuccessful, a type of antidepressant known as selective serotonin-reuptake inhibitor (SSRI) may be prescribed.

MENSTRUAL MIGRAINE

About half of all women who suffer from migraine can clearly link at least some of their attacks to their periods. Some women have migraine attacks only related to their period, not at other times of their menstrual cycle. It is thought that the drop in oestrogen that occurs just before a woman has a period is a migraine trigger. Women who think their migraines may be related to their menstrual cycle are recommended to keep a diary tracking their menstrual cycle and migraine attacks for three months to show to their doctor.

For help understanding this factsheet or further information on menstruation or menstrual problems, women in Queensland can contact the Health Information Line on 3216 0376 (within Brisbane) or 1800 017 676 (toll free outside Brisbane).

This is one of a series of women's health information factsheets available at www.womhealth.org.au.

This factsheet was last updated in January 2015. A full list of references is available from Women's Health or on the website.

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