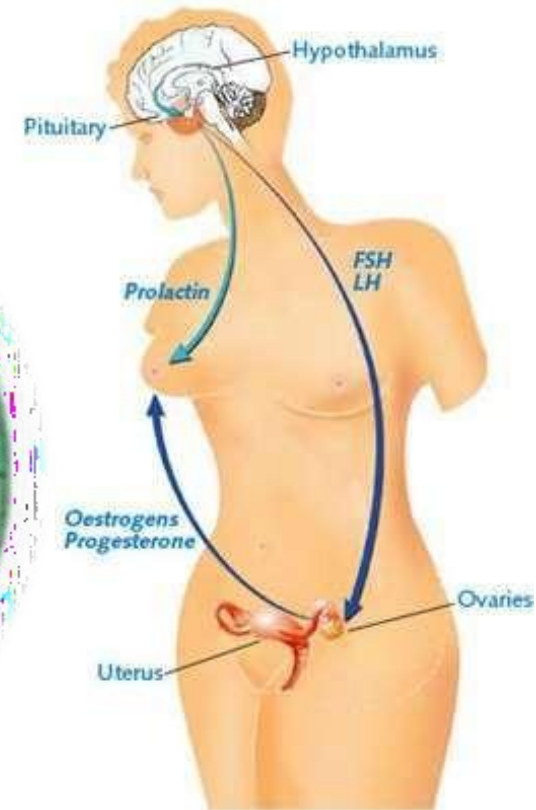
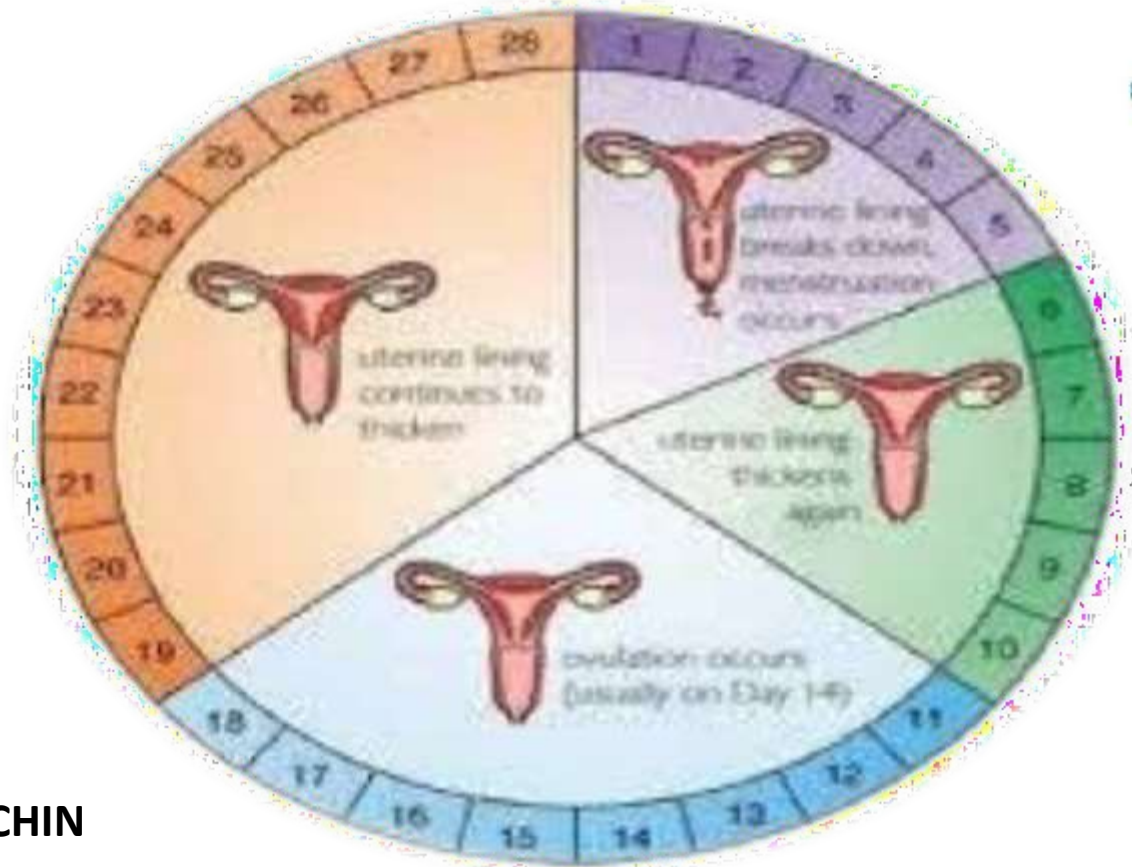


MENSTRUAL CYCLE AND IT'S DISORDERS



Introduction

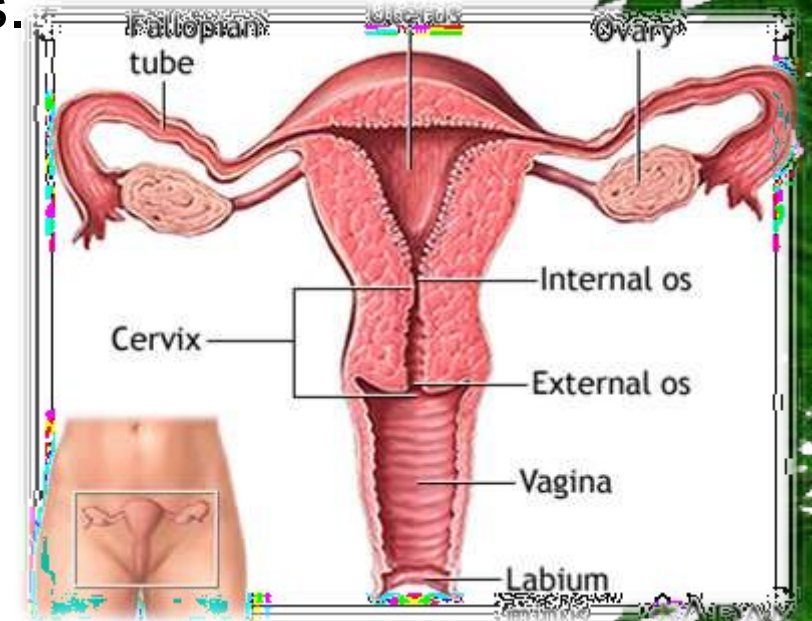
- * Periodic discharge of blood and cellular debris from the female genital tract is termed menstruation. Cyclical changes occurring from one menstruation to the next comprises a menstrual cycle.
- * The duration of menstrual cycle is about 28 ± 4 days (Range 21-35).
- * Duration of menstrual blood loss: 2-7 days, mean of 5 days.
- * Excessive menstruation >7 days.
- * Blood loss: difficult to evaluate. Racial differences.
- * 50–75% of menstrual flow is blood, the rest is made up of fragments of endometrial tissue and mucus.

normal estimated blood loss

- * Approximately 30-50 ml

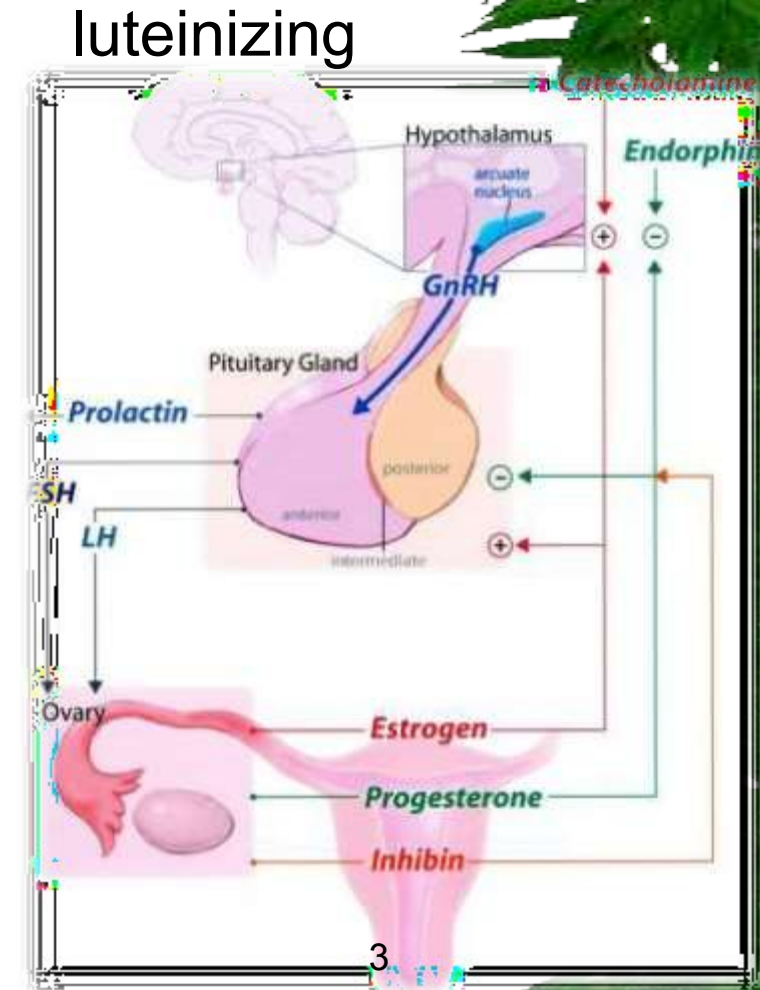
ovulation occur

- * Usually day 14



Normal Menstruation

- * Regulation of menstruation depends on the interaction of hormones
- * From the hypothalamus: gonadotropin releasing hormone (GnRH)
- * From the pituitary: follicle stimulating hormone (FSH), and hormone (LH)
- * From the ovary: estradiol and progesterone
- * GnRH is released in pulses and stimulates the secretion of FSH and LH from the pituitary
- * FSH and LH are released in pulses from the anterior pituitary
- * Estradiol is secreted from the ovary in response to FSH
- * Estradiol will in turn decrease or inhibit FSH secretion from the pituitary.



Normal Menstruation

❖ Hormone Control

- Follicular stimulating hormone (FSH) – glycoprotein
 1. • Stimulates follicular maturation during follicular phase
 2. • Stimulates steroid hormone secretion – oestrogen (by the granulosa cells of mature ovarian follicle)
- Luteinizing Hormone (LH) – glycoprotein
 1. • Stimulates steroid hormone secretion – oestrogen
 2. • Ovulation – mid-cycle surge of LH
 3. • Progesterone production by corpus luteum
- Negative feedback mechanism controls cycle



Menstrual cycle

Phases

- ❖ The menstrual cycle is divided into three phases:
 - * Follicular (Preovulatory) Phase
 - * Ovulatory Phase
 - * Luteal (Postovulatory) Phase

Menstrual Cycle Flow Chart

Follicle Stage: (10-14 days)

- Low estrogen = FSH to be released (negative feedback)
- This stimulates growth of follicle
- Follicle (egg) matures causing estrogen levels to go up
- Uterine lining begins to thicken again

Menstruation (3-5 days)

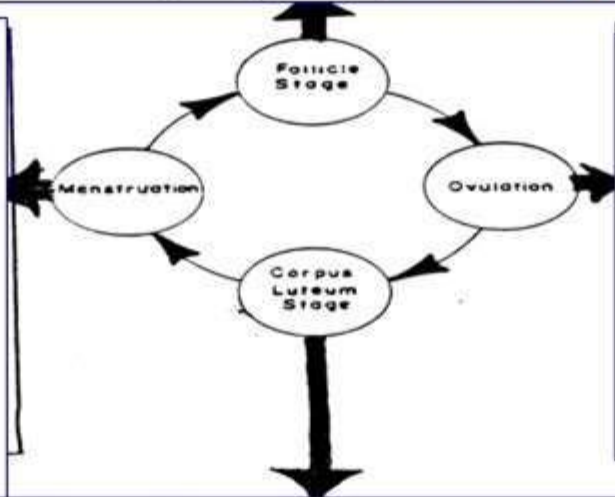
- Uterine lining sheds and FSH increases
- This causes drop in estrogen and progesterone
- Occurs if egg is not fertilized

Ovulation (1 day)

- Major SPIKE of LH
- This causes follicle to break and release egg into oviduct

Corpus Luteum Phase (10-14 days)

- LH and FSH levels crash
- Corpus luteum forms from broken follicle
- Corpus luteum secretes estrogen and progesterone
- This thickens uterine lining to prepare for egg



Menstrual Disorders

- * There are a number of different menstrual disorders. Problems can range from heavy, painful periods to no periods at all.
- * There are many variations in menstrual patterns, but in general women should be concerned when periods come fewer than 21 days or more than 3 months apart, or if they last more than 10 days.
- * Such events may indicate ovulation problems or other medical conditions.
- * **Dysmenorrhea (Painful Cramps)**
- * **Menorrhagia (Heavy Bleeding)**
- * **Amenorrhea (Absence of Menstruation)**
- * **Oligomenorrhea (Light or Infrequent Menstruation)**
- * **Premenstrual Syndrome (PMS)**

Dysmenorrhea (Painful Cramps)

- * Dysmenorrhea is severe, frequent cramping during menstruation. Pain occurs in the lower abdomen but can spread to the lower back and thighs.
- 1. Primary dysmenorrhea. Primary dysmenorrhea is cramping pain caused by menstruation. The cramps occur from contractions in the uterus and are usually more severe during heavy bleeding.
- 2. Secondary dysmenorrhea. Secondary dysmenorrhea is menstrual-related pain that accompanies another medical or physical condition, such as endometriosis or uterine fibroids.

□ CLINICAL FEATURES

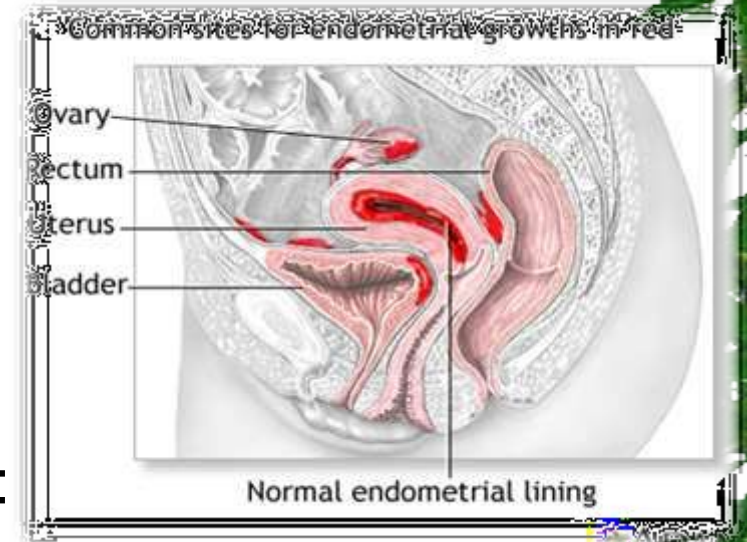
- * Uterine cramping Nausea Vomiting, Fatigue, Diarrhea, Headache, Giddiness

Causes of Dysmenorrhea (Painful Periods)

- * Primary dysmenorrhea is caused by prostaglandins, hormone-like substances that are produced in the uterus and cause the uterine muscle to contract. Prostaglandins also play a role in the heavy bleeding that causes dysmenorrhea.
- * Secondary dysmenorrhea can be caused by a number of medical conditions.

Common causes of secondary dysmenorrhea include:

- * Endometriosis. Endometriosis is a chronic and often progressive disease that develops when the tissue that lines the uterus (endometrium) grows onto other areas, such as the ovaries, bowels, or bladder. It often causes chronic pelvic pain.



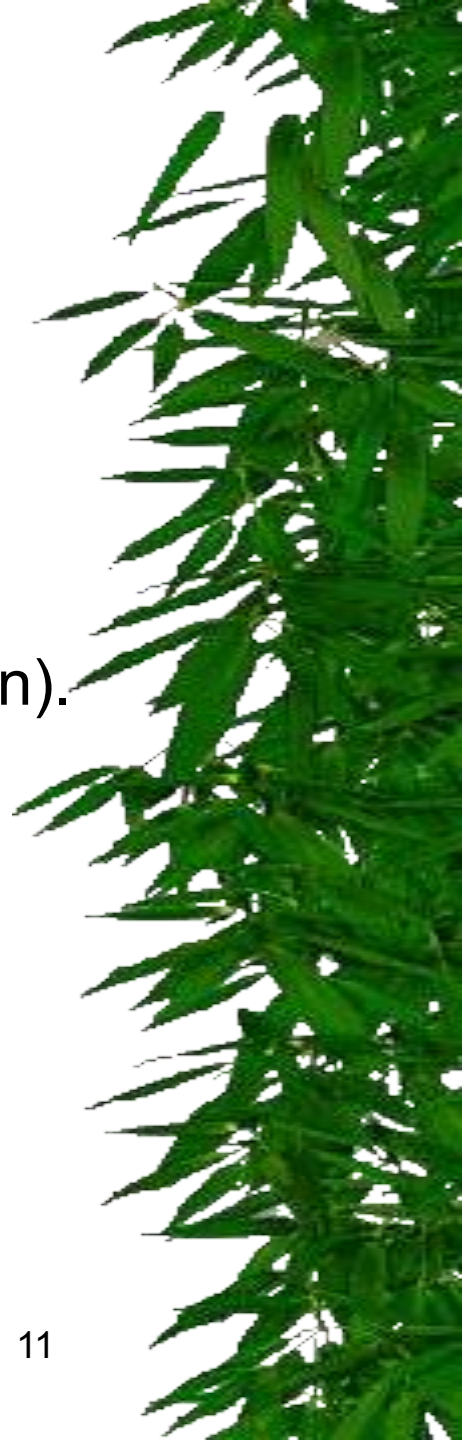
Menorrhagia

- * Menorrhagia is menstrual flow that lasts longer and is heavier than normal. The bleeding occurs at regular intervals (during periods). It usually lasts more than 7 days and women lose an excessive (more than 80 mL) amount of blood.
- * Menorrhagia is a type of abnormal uterine bleeding.

Other types of abnormal bleeding are:

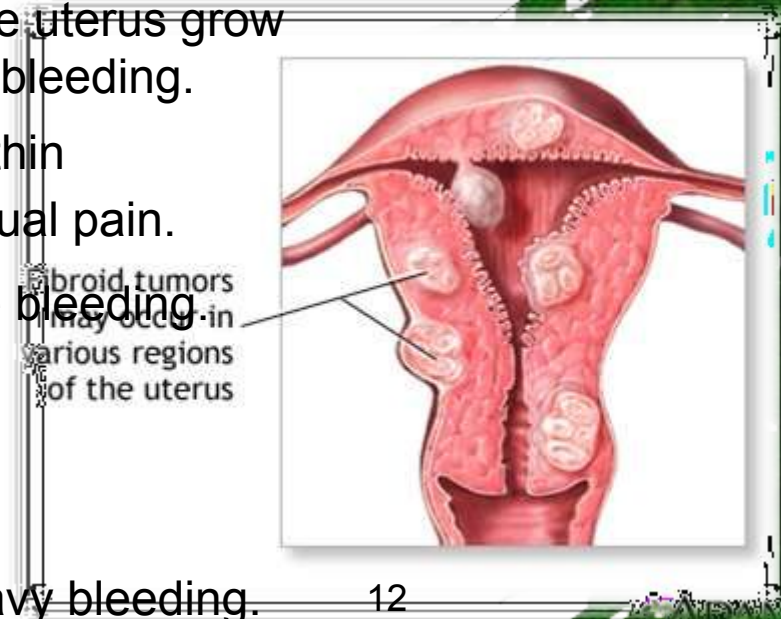
- *Metrorrhagia*
- *Menometrorrhagia*
- *Dysfunctional uterine bleeding (DUB)*

- Metrorrhagia, also called breakthrough bleeding, refers to bleeding that occurs at irregular intervals and with variable amounts. The bleeding occurs between periods or is unrelated to periods.
- Menometrorrhagia refers to heavy and prolonged bleeding that occurs at irregular intervals. Menometrorrhagia combines features of menorrhagia and metrorrhagia.
- Dysfunctional uterine bleeding (DUB) is a general term for abnormal uterine bleeding that usually refers to extra or excessive bleeding caused by hormonal problems, usually lack of ovulation (anovulation). DUB tends to occur either when girls begin to menstruate or when women approach menopause, but it can occur at any time during a woman's reproductive life.
- Other types of abnormal uterine bleeding include bleeding after sex and bleeding after menopause.



Causes of Menorrhagia (Heavy Bleeding)

- * There are many possible causes for heavy bleeding:
- * **Hormonal Imbalances**. Imbalances in estrogen and progesterone levels can cause heavy bleeding
- * **Ovulation Problems**. If ovulation does not occur (anovulation), the body stops producing progesterone, which can cause heavy bleeding.
- * **Uterine Fibroids**. Uterine fibroids are a very common cause of heavy and prolonged bleeding.
- * **Uterine Polyps**. Uterine polyps (small benign growths) and other structural problems or other abnormalities in the uterus may cause bleeding.
- * **Endometriosis** : Endometriosis, a condition in which the cells that line the uterus grow outside of the uterus in other areas, such as the ovaries, can cause heavy bleeding.
- * **Adenomyosis**, a related condition where endometrial tissue develops within the muscle layers of the uterus, can also cause heavy bleeding and menstrual pain.
- * **Cancer**. Rarely, uterine, ovarian, and cervical cancer can cause excessive bleeding.
- * **Infection**. Infection of the uterus or cervix can cause bleeding.
- * Pregnancy or Miscarriage.
- * **Other Medical Conditions**. Systemic lupus erythematosus, diabetes, pelvic inflammatory disorder, cirrhosis, and thyroid disorders can cause heavy bleeding.
- * **Fibroid tumors**



Amenorrhea (Absence of Menstruation)

- * Amenorrhea is the absence of menstruation. There are two categories: primary amenorrhea and secondary amenorrhea:
- ◆ **Primary amenorrhea** occurs when a girl does not begin to menstruate by age 16. Girls who show no signs of sexual development (breast development and pubic hair) by age 13 should be evaluated by a doctor. Any girl who does not have her period by age 15 should be evaluated for primary amenorrhea.
- ◆ **Secondary amenorrhea** occurs when periods that were previously regular stop for at least 3 months.

* **CLINICAL FEATURES**

- * • Amenorrhea, Lower abdominal pain, Retention of urine, Bulging hymen, Uniform globular mass in the abdomen.

Oligomenorrhea (Light or Infrequent Menstruation)

- * Oligomenorrhea is a condition in which menstrual cycles are infrequent, greater than 35 days apart. It is very common in early adolescence and does not usually indicate a medical problem.
- * When girls first menstruate they often do not have regular cycles for several years. Even healthy cycles in adult women can vary by a few days from month to month. Periods may occur every 3 weeks in some women, and every 5 weeks in others. Flow also varies and can be heavy or light. Skipping a period and then having a heavy flow may occur; this is most likely due to missed ovulation rather than a miscarriage

Causes of Amenorrhea and Oligomenorrhea (Absent or Light Periods)

- * Consistently absent periods may be due to the following factors:
- * **Delayed Puberty**. A common cause of primary amenorrhea (absence of periods) is delayed puberty due to some genetic factor that delays physical development.
- * **Hormonal Changes and Puberty**. Oligomenorrhea (light or infrequent menstruation) is commonly experienced by girls who are just beginning to have their periods.
- * **Weight Loss and Eating Disorders**: Extreme weight loss and reduced fat stores lead to hormonal changes that include low thyroid levels (hypothyroidism) and elevated stress hormone levels (hypercortisolism). These changes produce a reduction in reproductive hormones.
- * **Polycystic Ovarian Syndrome (PCOS)**. PCOS is a condition in which the ovaries produce high amounts of androgens (male hormones), particularly testosterone. Amenorrhea or oligomenorrhea is quite common in women who have PCOS.
- * **Endometriosis and adenomyosis**: can cause severe pelvic pain especially during menstruation. In endometriosis, cells from the tissue that lines the uterus grow in sites outside the uterus. In adenomyosis, these endometrial cells grow within and become attached to the muscular walls of the uterus.

Premenstrual Syndrome (PMS)

- * Premenstrual syndrome (PMS) is a set of physical, emotional, and behavioural symptoms that occur during the last week of the luteal phase (a week before menstruation) in most cycles.
- * The symptoms typically do not start until at least day 13 in the cycle, and resolve within 4 days after bleeding begins.
- * Women may begin to have premenstrual syndrome symptoms at any time during their reproductive years, but it usually occurs when they are in their late 20s to early 40s.
- * Once established, the symptoms tend to remain fairly constant until menopause, although they can vary from cycle to cycle

Risk Factors

- * **Age** plays a key role in menstrual disorders. Girls who start menstruating at age 11 or younger are at higher risk for severe pain, longer periods, and longer menstrual cycles.

Other risk factors include:

- * **Weight**. Being either excessively overweight or underweight can increase the risk for dysmenorrhea and amenorrhea.
- * **Menstrual** Cycles and Flow. Longer and heavier menstrual cycles are definitely associated with painful cramps.
- * **Pregnancy History**. Women who have had a higher number of pregnancies are at increased risk for menorrhagia. Women who have never given birth have a higher risk of dysmenorrhea,
- * **Smoking**. Smoking can increase the risk for heavier periods.
- * **Stress**. Physical and emotional stress may block the release of luteinizing hormone, causing temporary amenorrhea.

Complications

□ **Anaemia**

Menorrhagia is the most common cause of anaemia (reduction in red blood cells) in premenopausal women. A blood loss of more than 80mL (around three tablespoons) per menstrual cycle can eventually lead to anemia.

□ **Osteoporosis**

Amenorrhea caused by reduced estrogen levels is linked to osteopenia (loss of bone density) and osteoporosis (more severe bone loss that increases fracture risk). Because bone growth is at its peak in adolescence and young adulthood, losing bone density at that time is very dangerous, and early diagnosis and treatment is essential for long-term health.

□ **Infertility**

Some conditions associated with heavy bleeding, such as ovulation abnormalities, fibroids, or endometriosis, are important contributors to infertility. Many conditions that cause amenorrhea, such as ovulation abnormalities and polycystic ovary syndrome, can also cause infertility.

Diagnosis

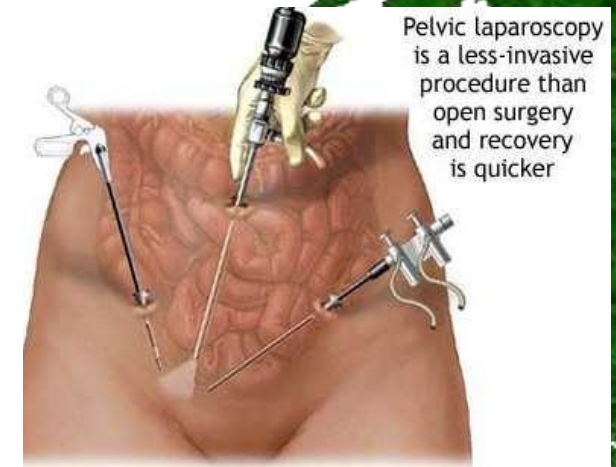
- * Your doctor may ask questions concerning:
 - * Menstrual cycle patterns -- length of time between periods, number of days that periods last, number of days of heavy or light bleeding
 - * The presence or history of any medical conditions that might be causing menstrual problems
 - * Any family history of menstrual problems
 - * History of pelvic pain
 - * Regular use of any medications (including vitamins and over-the-counter drugs)
 - * Diet history, including caffeine and alcohol intake
 - * Past or present contraceptive use
 - * Any recent stressful events
 - * Sexual history
- * Menstrual Diary. A menstrual diary is a helpful way to keep track of changes in menstrual cycles. You should record when your period starts, how long it lasts, and the amount of bleeding and pain that occurs during the course of menstruation.
- * Pelvic Examination. A pelvic exam is a standard part of diagnosis. A Pap test may be done during this exam.

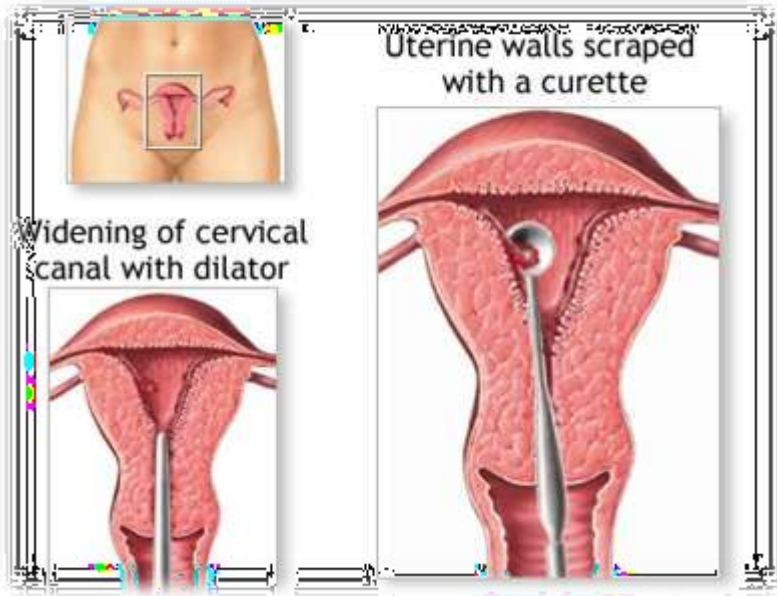
Blood, Hormonal Tests and ultrasound

1. **Blood tests** can help rule out other conditions that cause menstrual disorders. For example, your doctor may test thyroid function to make sure that low thyroid (hypothyroidism) is not present. Blood tests can also check follicle-stimulating hormone, estrogen, and prolactin levels.
- * Patients who have amenorrhea may need to receive special hormonal tests.
 - * A failure to bleed could indicate an abnormal uterus that prevents outflow or insufficient estrogen. In such cases, the next step may be to administer estrogen, followed by progestin. If bleeding occurs after that, the cause of amenorrhea is related to low estrogen levels. The doctor will then check for ovarian failure, anorexia, or other causes of low estrogen. If bleeding does not occur, the doctor would check for obstructions that are preventing outflow of menstruation
- **Ultrasound and Sonohysterography**. Ultrasound is the standard imaging technique for evaluating the uterus and ovaries, detecting fibroids, ovarian cysts and tumors, and finding obstructions in the urinary tract
- * Transvaginal sonohysterography uses ultrasound along with saline (salt water) injected into the uterus to enhance the visualization of the uterus.

Other Diagnostic Procedures

- * **Hysteroscopy**. Hysteroscopy is a procedure that can detect the presence of fibroids, polyps, or other causes of bleeding.
- * **Laparoscopy**. Diagnostic laparoscopy, an invasive surgical procedure, used to treat endometriosis. Laparoscopy normally requires a general anesthetic, although the patient can go home the same day. The procedure involves inflating the abdomen with gas through a small abdominal incision.
- * **Endometrial Biopsy**. When heavy or abnormal bleeding occurs, an endometrial (uterine) biopsy can be performed in the doctor's office. This procedure can help identify abnormal cells, which suggest that cancer may be present. It may also help the doctor decide on the best hormonal treatment to use.
- * **Dilation and Curettage (D&C)**. Dilation and curettage (D&C) is a more invasive procedure:
 - * The cervix (the neck of the uterus) is dilated (opened).
 - * The surgeon scrapes the inside lining of the uterus and cervix.
 - * The procedure is used to take samples of the tissue and to relieve heavy bleeding in some instances. D&C can also be effective in scraping off small endometrial polyps, but it is not useful for most fibroids, which tend to be larger and more firmly attached.

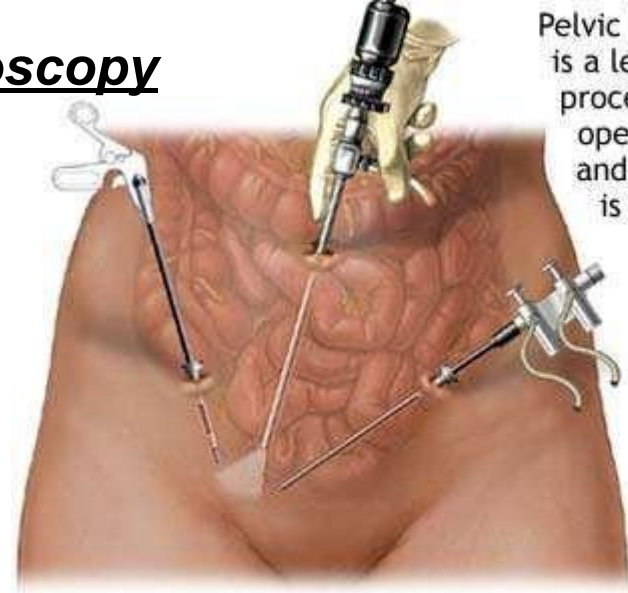




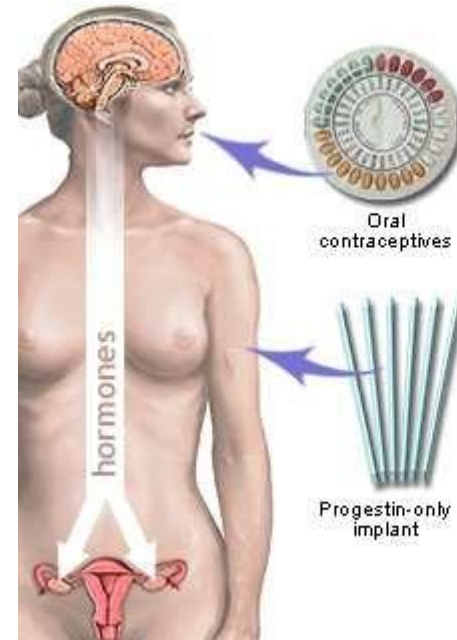
D and C

Hormone-based contraceptives

Laparoscopy



Pelvic laparoscopy is a less-invasive procedure than open surgery and recovery is quicker



Combined estrogen-progestin birth control pills and progestin-only pills or implants prevent the pituitary gland's release of hormones that stimulate ovulation

Lifestyle Changes

□ Dietary Factors

- * Making dietary adjustments starting about 14 days before a period may help some women with certain mild menstrual disorders, such as cramping.
- * Limiting salt (sodium) may help reduce bloating. Limiting caffeine, sugar, and alcohol intake may also be beneficial.

□ Preventing and Treating Anemia

1. Dietary Forms of Iron. Women who have heavy menstrual bleeding can sometimes become anemic. Eating iron-rich foods can help prevent anemia. Iron found in foods is either in the form of heme or non-heme iron. Heme iron is better absorbed than non-heme iron.
2. Heme iron: foods include (in order of iron-richness) clams, oysters, organ meats, beef, pork, poultry, and fish.
3. Non-heme iron : Such vegetable products include dried beans and peas, iron-fortified cereals, bread, and pasta products, dark green leafy vegetables (chard, spinach, mustard greens, kale), dried fruits, nuts, and seeds.



Other Lifestyle Measures

- * **Exercise.** Exercise may help reduce menstrual pain.
- * **Sexual Activity.** There have been reports that orgasm reduces the severity of menstrual cramps.
- * **Applying Heat.** Applying a heating pad to the abdominal area, or soaking in a hot bath, can help relieve the pain of menstrual cramps.
- * **Menstrual Hygiene.** Change tampons every 4 - 6 hours. Avoid scented pads and tampons; feminine deodorants can irritate the genital area. Douching is not recommended because it can destroy the natural bacteria normally present in the vagina. Bathing regularly is sufficient.

Alternative Remedies

- * **Acupuncture and Acupressure**. Some studies have reported relief from pelvic pain after acupuncture or acupressure, a technique that applies small pins or pressure to specific points on the body.
- * **Herbs and Supplements**. Generally, manufacturers of herbal remedies and dietary supplements do not need approval from the Food and Drug Administration to sell their products.
- * **Black cohosh** (also known as Cimicifuga racemosa or squawroot) contains a plant estrogen and is the most studied herbal remedy for treating menopausal symptoms, including dysmenorrhea, although most studies have indicated it is ineffective. It should not be taken for more than 6 months.
- * **Ginger tea or capsules** may help to relieve nausea and bloating.
- * **Magnesium supplements** may be helpful for relieving dysmenorrhea. Some women also report benefit with vitamin B1 (thiamine) supplements

Medications

There are a number of different medicines prescribed for menstrual disorders.

Common Pain Relievers for Cramps

□ **(NSAIDs).**

- * Nonsteroidal anti-inflammatory drugs (NSAIDs) block prostaglandins, the substances that increase uterine contractions. They are effective painkillers that also help control the inflammatory factors that may be responsible for heavy menstrual bleeding. Aspirin is the most common NSAID.
 - * Among the most effective NSAIDs for menstrual disorders are ibuprofen (Advil, Motrin, Midol PMS, generic) and naproxen (Aleve, generic), which are both available over-the-counter, and mefenamic acid (Ponstel, generic), which requires a doctor's prescription
- **Acetaminophen.** Acetaminophen (Tylenol, generic) is a good alternative to NSAIDs, especially for women with stomach problems or ulcers. Some products (Pamprin, Premsyn, generic) combine acetaminophen with other drugs, such as a diuretic, to reduce bloating.

Medications

Oral Contraceptives

- * Oral contraceptives (OCs), commonly called birth control pills or "the Pill," contain combinations of an estrogen and a progesterone (in a synthetic form called progestin). The estrogen compound used in most combination OCs is estradiol. There are many different progestins, but common types include levonorgestrol, drospirenone, norgestrol, norethindrone, and desogestrel.
- * OCs are often used to regulate periods in women with menstrual disorders, including menorrhagia (heavy bleeding), dysmenorrhea (severe pain), and amenorrhea (absence of periods).

Medications

- * Standard OCs usually come in a 28-pill pack with 21 days of “active” (hormone) pills and 7 days of “inactive” (placebo) pills. Newer “extended-cycle (also called “continuous-use” or “continuous-dosing”) oral contraceptives aim to reduce -- or even eliminate -- monthly menstrual periods. These OCs contain a combination of estradiol and the progestin levonorgestrel, but they use extending dosing of active pills.
- * Extended-cycle oral contraceptives include:
- * Seasonale and Seasonique, which reduce periods to about 3 or 4 times a year
- * *Lybrel*, which completely eliminates monthly menstrual periods in many women

Medications

Progestins

- * Progestins (synthetic progesterone) are used by women with irregular or skipped periods to restore regular cycles. They also reduce heavy bleeding and menstrual pain, and may protect against uterine and ovarian cancers.
- * Progestins can be delivered in various forms.
- * Oral. Short-term treatment of an ovulatory bleeding (bleeding caused by lack of ovulation) may involve a 21-day course of an oral progestin on days 5 - 26. Medroxyprogesterone (Provera, generic) is commonly used.

Intrauterine Device (Mirena).

An intrauterine device (IUD) that releases progestin can be very beneficial for menstrual disorders, regardless of its contraceptive effects. The LNG-IUS has been proven to reduce heavy bleeding and pain in many women who suffer from menorrhagia and dysmenorrhea.

Medications

GnRH Agonists

- * Gonadotropin releasing hormone (GnRH) agonists are sometimes used to treat severe menorrhagia. GnRH agonists block the release of the reproductive hormones LH (luteinizing hormone) and FSH (follicular-stimulating hormone). As a result, the ovaries stop ovulating and no longer produce estrogen.
- * GnRH agonists include the implant goserelin (Zoladex), a monthly injection of leuprolide (Lupron Depot), and the nasal spray nafarelin (Synarel).
- * Commonly reported side effects, which can be severe in some women, include menopausal-like symptoms. These symptoms include hot flashes, night sweats, changes in the vagina, weight change, and depression.

Danazol

- * Danazol (Danocrine, generic) is a synthetic substance that resembles a male hormone. It suppresses estrogen, and therefore menstruation, and is occasionally used (sometimes in combination with an oral contraceptive) to help prevent heavy bleeding. Adverse side effects include facial hair, deepening of the voice, weight gain, acne, and reduced breast size. Danazol may also increase the risk for unhealthy cholesterol levels and it may cause birth defects.

Medications

Non-Hormonal Drugs (Lysteda)

- * Tranexamic acid (Lysteda) is a recently approved medication for treating heavy menstrual bleeding. Approved in 2009, it is the first non-hormonal drug for menorrhagia treatment. Tranexamic acid is given as a pill. It is an antifibrinolytic drug that helps blood to clot.

Surgery

Women with heavy menstrual bleeding, painful cramps, or both have surgical options available to them. Most procedures eliminate or significantly affect the possibility for childbearing, however. Hysterectomy removes the entire uterus while endometrial ablation destroys the uterine lining.



Endometrial Ablation

- * In endometrial ablation, the entire lining of the uterus (the endometrium) is removed or destroyed. For most women, this procedure stops the monthly menstrual flow. In some women, menstrual flow is not stopped but is significantly reduced.

Candidates Endometrial ablation is not appropriate for women who:

- * Have gone through menopause
- * Have recently been pregnant
- * Would like to have children in the future
- * Have certain gynecologic conditions such as cancer of the uterus, endometrial hyperplasia, uterine infection, or an endometrium that is too thin
- * **Types of Endometrial Ablation.** Endometrial ablation used to be performed in an operating room using electrosurgery with a resectoscope (a hysteroscope with a heated wire loop or roller ball.) Laser ablation was another older procedure. These types of endometrial ablation have largely been replaced by newer types of procedure that do not use a resectoscope.



Thank You