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FERTILITY & SEXUAL HEALTH

Mei Yin, 40, is a bank manager. She got married when she was 32 years old. As she was pursuing her Master's degree then, she decided to postpone starting a family. Three years later, she and her husband decided to try for a baby, but by then, the 35-year-old had difficulty conceiving. After repeated attempts at natural conception over the course of more than a year, she decided to seek help, and was placed on **fertility treatment** by her doctor. Mei Yin successfully conceived six months later, and is now the proud mother of a beautiful two-year-old daughter.

HEALTHY FEMALE BODY

Females start puberty between the ages of nine and 16. During this time, the female hormones oestrogen and progesterone prepare the womb (uterus) for a cycle of fertility, and the female body begins menstruation or periodic (usually monthly) bleeding. Each month, the ovaries release an egg, which travels down the fallopian tube to the uterus. If the egg is fertilised by a sperm cell and attaches to the uterus, pregnancy occurs. Otherwise, the unfertilised egg, together with the thick lining of the uterus (known as the endometrium), is discharged from the body during menstruation.

A period or menstruation is the monthly discharge of blood and tissue from the womb. Menstrual blood flows from the uterus through the small opening in

the cervix, and passes out of the body through the vagina. The first day of your menstruation or period is considered as Day 1 of your menstrual cycle. If you become pregnant, your menstruation will cease and only return after childbirth. Just as the appearance of your monthly periods signifies the beginning of your reproductive years, your fertile years end with menopause.

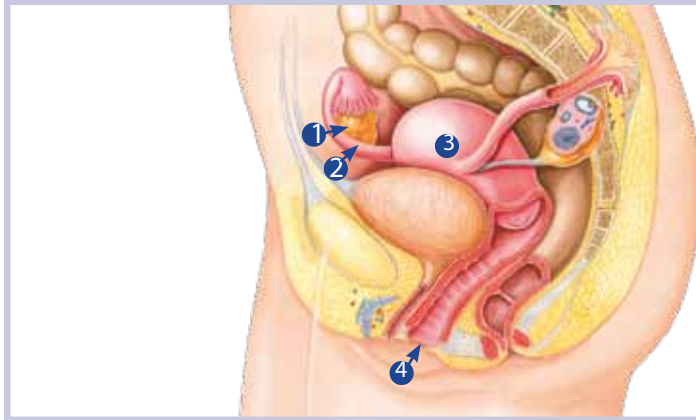
Menstrual bleeding normally lasts between 2–7 days, with an average of five days. The average menstrual cycle is 28–30 days, although anything between 24–35 days is common. Some women, however, have irregular menstrual cycles. The time between periods, the amount of blood lost and the number of days bleeding lasts all vary widely. It is a condition that affects a woman's fertility.

Preparing your body for pregnancy includes paying proper attention to your fertility and sexual health



The Female Reproductive System

The female reproductive system includes the ovaries, fallopian tubes, uterus (womb), vagina and cervix.



1. Ovary
2. Fallopian Tube
3. Uterus
4. Vagina

A woman is generally fertile for over 30 years, peaking between the ages of 22 and 26, and often declining after the age of 30. According to the Human Fertilisation and Embryology Authority (UK), those at 35 are half as fertile as when they were at 25, and at 40, half as fertile as at 35. With more and more women now postponing pregnancy, infertility is increasingly a problem as a result of changes to the reproductive system due to age and other external factors. Knowing all about your reproductive and sexual health is vital to safeguarding your fertility and ensuring your overall well-being.

MENSTRUAL DISORDERS

Most women menstruate over a span of more than 30 years, from early adolescence until their late 40s or early 50s. They usually get their periods regularly without any problems. However, there are women who suffer from menstrual disorders such as menstrual cramps, anovulation (the absence of menstruation), heavy or irregular periods.

While each woman's reproductive health is unique, the more common menstrual disorders include the following:

Premenstrual Syndrome (PMS)

Premenstrual syndrome (PMS), also known as premenstrual tension (PMT), refers to the physical, psychological and behavioural symptoms that affect some 75% of women anytime between one day to two weeks before the onset of the monthly period. These symptoms usually improve when the woman's period begins, and disappear a few days after.

According to the Department of Obstetrics & Gynaecology at KK Women's and Children's Hospital, common PMS symptoms include:

- **Physical symptoms:** Fluid retention, abdominal discomfort and bloating, appetite disturbance (typically increased), headache, backache, muscle ache, joint pain, breast tenderness, insomnia, lethargy or fatigue, and nausea
- **Psychological symptoms:** Mood swings, feeling upset or emotional, feeling irritable or angry, sensitivity to rejection, social withdrawal, depression, anxiety, sense of being overwhelmed, difficulty concentrating, confusion and forgetfulness
- **Behavioural symptoms:** Loss of interest in sex, changes in appetite, and for some, occasional food cravings (e.g. carbohydrates)

For the majority of women, these symptoms may be mild and tolerable. However, for a small group of women, these symptoms may be debilitating and can cause significant disruptions to their daily lives. In such cases, they are said to be suffering from a condition known as premenstrual dysphoric disorder (PMDD), a disabling condition marked by severe PMS that can adversely affect work and relationships with people. It is imperative to seek medical treatment to manage the symptoms.

Causes

While the exact causes for PMS and PMDD are still indeterminate, medical experts at the Massachusetts General Hospital Center for Women's Mental Health point out that researchers now agree that "these disorders represent biological phenomena rather than purely psychological events," and that recent research has also drawn links to a particular sensitivity to normal hormonal changes during the menstrual cycle. Stress, being overweight and lack of exercise can also contribute to it.

Painful Periods

Many women suffer from painful cramps immediately before or during menstrual periods. This condition is known as dysmenorrhoea. For some women, the pain can be so excruciating that they are unable to participate in their usual activities and are instead confined to just grappling with the pain.

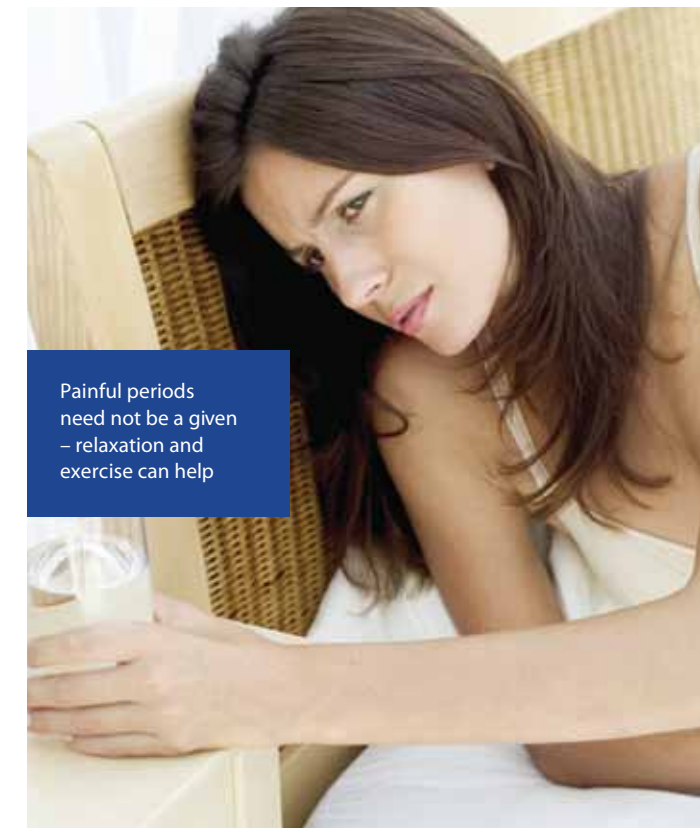
There are two types of dysmenorrhoea: primary dysmenorrhoea and secondary dysmenorrhoea. **Primary dysmenorrhoea** or common menstrual cramps is due to excessive levels of the hormone-like prostaglandin causing contractions of the uterine wall, producing cramp-like, aching pain in the lower abdomen or back that can range from mild to severe. These often start shortly before or at the onset of the period, and last for 1–3 days. These cramps often resolve with age or after having the first baby.

Secondary dysmenorrhoea is menstrual

Easing Painful Periods

Placing a hot water bottle or heating pad on your lower abdomen, taking a warm bath, or gently massaging the area lightly in a circular movement with your fingers may provide some pain relief.

pain with an underlying cause often related to problems in the female reproductive organs, such as uterine fibroids, pelvic inflammatory disease and endometriosis. It might also be caused by the use of an intrauterine device (IUD), especially in the early months after insertion. Pain from secondary dysmenorrhoea usually begins earlier in the menstrual cycle and lasts longer than common menstrual cramps.



Painful periods need not be a given – relaxation and exercise can help

What you can do

Placing a hot water bottle or heating pad on your lower abdomen, taking a warm bath, or gently massaging the area lightly in a circular movement with your fingers may provide some pain relief.

Get rest when needed, and avoid caffeine, smoking and alcohol. Relaxation techniques such as meditation and yoga can help take your mind off the pain, while drinking herbal teas such as mint or camomile can lessen the cramping pain for some women. Women who exercise regularly also suffer from less menstrual pain, so this would be yet another way you can battle menstrual cramps.

If over-the-counter painkillers are not effective, consult your doctor for alternatives. Depending on the severity of the problem, he may put you on birth control pills for 6–12 months, which has been proven to be an effective treatment. If the pain is caused by the use of IUD, your doctor may suggest an alternative method of birth control.

Irregular Periods

Amenorrhoea refers to the absence of menstruation on a permanent or temporary basis. Oligomenorrhoea refers to infrequent menstrual periods, or having a period only now and then. Both refer to conditions characterised by irregular menstruation patterns.

Amenorrhoea is classified into primary amenorrhoea and secondary amenorrhoea. Primary amenorrhoea occurs in young females who have failed to begin menstruating by the age of 16, typically as the result of a genetic or anatomical condition. Secondary amenorrhoea is when normal menstruation is interrupted for three or more consecutive periods, or for more than six months in a woman who was previously menstruating. Infertility and bone loss (osteoporosis) are symptoms complications of extended amenorrhoea.

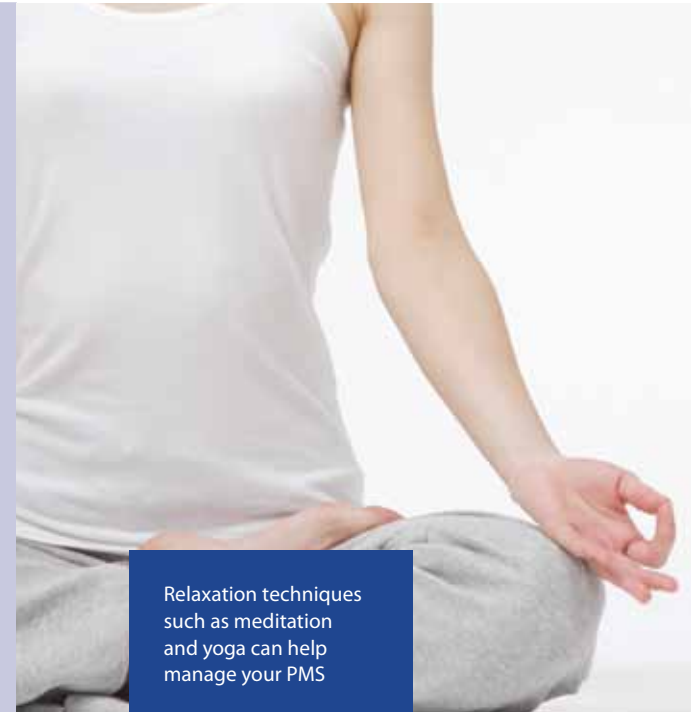
Irregular periods are common in girls who are

manage your PMS symptoms

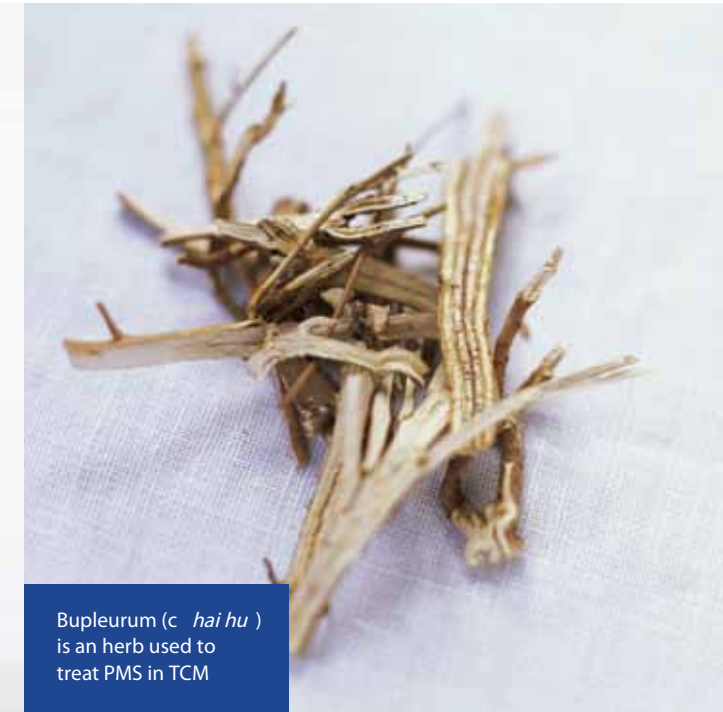


While a cure for PMS may not exist for now, there are lifestyle changes and treatments available to help you manage your symptoms:

- **Keep a PMS diary.** Take note of changes such as irritability, moodiness, fluid retention, breast tenderness and food cravings and include the details of your menstrual cycle – e.g. the first and last days of your menstrual period – and any ovulation symptoms. Keep this diary for at least three menstrual cycles to rule out other possible causes.
- **Rest and relax with enjoyable activities,** and try to limit stressful situations as far as possible. Manage your stress with activities such as meditation and tai chi.
- **Share your feelings** with family or close friends if you find that your PMS symptoms are getting you down.
- **Regular aerobic exercise** helps to keep you fit and eases some of the minor symptoms such as lethargy and insomnia. Aim for at least three times a week and increase the frequency during the premenstrual period.
- **Dietary changes** such as eating smaller meals more frequently and cutting down on caffeine, high fat, sugary and salty foods can help to balance your blood sugar levels and reduce symptoms such as mood swings, fluid retention and bloating.
- **Stay hydrated** to help reduce symptoms such as bloating.



Relaxation techniques such as meditation and yoga can help manage your PMS



Bupleurum (c *hai hu*) is an herb used to treat PMS in TCM

- **Avoid alcohol and smoking,** which can aggravate the symptoms of PMS such as breast tenderness, food cravings, mood swings and depression.
- **Nutritional supplements** such as calcium (a dose of 1200 mg/day can reduce PMS symptoms by half) and vitamin B6 (50–100 mg a day; toxic at higher doses) have been shown to be beneficial for easing PMS symptoms.
- **Herbal remedies.** Chasteberry (*vitex agnus castus*; aka agnus castus fruit extract) has been reported as being helpful for easing premenstrual symptoms such as irritability, anger, headache and breast fullness.
Herbs commonly used in traditional Chinese medicine (TCM) to ease PMS symptoms and to tonify the uterus include *dang gui* (*angelica sinensis*; aka Chinese angelica), bupleurum root (Ch: *chai hu*; *radix bupleuri*), poria (*fu ling*; *sclerotium poriae cocos*), tangerine peel (*chen pi*; *pericarpium citri reticulatae*), licorice root (*gan cao*; *radix glycyrrhizae*), white peony root (*bai shao*; *radix paeoniae*), mint leaf (*bo he*; *herba menthae*), rose (*mei gui hua*; *rosa rugosa*), fresh ginger (*sheng jiang*; *zingiber officinale*

rosc.), medicinal evodia fruit (*wu zhu yu*; *evodia rutaecarpa (juss.) benth*) and Chinese cinnamon (*rou gui*; *cinnamomum cassia presl*).

- **Medical treatments and psychotherapy** are used when PMS symptoms are more severe. These include:
 - **Cognitive behavioural therapy** (see Chapter 9) can help with problems such as anxiety and depression.
 - **Non-steroidal anti-inflammatory drugs** can reduce aches and pains.
 - **Oral contraceptive pills** are prescribed to stop ovulation and stabilise hormone levels, which can help to combat mood swings.
 - **Antidepressants** such as selective serotonin reuptake inhibitors (SSRIs) may be the most effective treatment for PMDD and severe PMS for the relief of fatigue, depressed moods and sleep problems.
 - **Gonadotropin-releasing hormone analogue therapy (GnRH-a)** is used when all else fails. These synthetic hormones create a temporary menopause and stop periods by blocking the production of oestrogen and progesterone. Significant side effects include osteoporosis.

just beginning to menstruate. After a year or two, the menstrual cycle will usually start to become regular.

Causes

Irregular periods may be caused by different factors, including the following:

- **Genetic conditions** such as gonadal dysgenesis, Turner syndrome, congenital adrenal hyperplasia, androgen insensitivity and polycystic ovarian syndrome (see section on Pelvic Pain)
- **Puberty or nearing menopause**
- **Certain contraceptives and medications**
- **Change in contraception method**
- **Lifestyle changes** such as excessive exercise, extreme weight loss or weight gain, eating disorders and stress
- **Hormonal changes** involving the hypothalamus, pituitary, thyroid, ovary, or adrenal glands (e.g. hormone imbalance of oestrogen and progesterone, the hormones regulating the menstrual cycle; hypothyroidism)
- **Diseases and abnormalities in the reproductive system** (e.g. pregnancy, hypothalamic or pituitary diseases, endometriosis and cancer)

What you can do:

Missing a few periods is usually no cause for alarm. Make a few lifestyle changes, such as eating a healthy diet and getting enough rest and exercise, and stay

Consult a doctor if you have prolonged menstrual pain and heavy bleeding

relaxed and patient. Chances are, your menstrual cycle will be back to normal again soon.

To rule out any abnormality, see a doctor if menstruation has not started by the age of 16, or if your periods have been absent for more than six months when you're not pregnant or menopausal. Treatment for irregular periods varies according to the cause.

Heavy Periods

Heavy menstruation, or menorrhagia, refers to the occurrence of abnormally heavy bleeding during regular menstrual periods, over several consecutive menstrual cycles.

The amount of blood discharged during a woman's period can vary considerably from woman to woman, and it is difficult to quantify objectively what heavy blood loss is. You will be able to tell if your periods are heavier than normal – you may find yourself using more sanitary pads or tampons than usual, or that your clothes and bedding are stained. If your periods are causing such disruptions to your everyday life, it may be an indication of excessive blood loss.

Causes

Most causes of heavy menstruation are not serious, and are rarely due to cancer. According to the Department of Obstetrics & Gynaecology at KK Women's and Children's Hospital, up to 50% of the cases have no known cause, and are referred to as dysfunctional uterine bleeding.

Some causes of heavy periods include:

- **Hormonal imbalance**
- **Change in contraception method.** Changes in birth control pills or oestrogens, or use of the IUD.
- **Infection of the womb**
- **Dysfunction of the ovaries.** Lack of ovulation (anovulation) may cause hormonal imbalance and result in menorrhagia.

- **Abnormal growths in the uterus,** such as polyps and fibroids (see section below under "Pelvic Pain").
- **Adenomyosis,** a condition in which the walls of the womb are abnormally thick as a result of glands from the endometrium becoming embedded in the uterine muscle.
- **Conditions that produce high oestrogen levels,** such as certain ovarian cysts (see section on Pelvic Pain), may stimulate the lining of the womb and cause bleeding.
- **Medication** such as anti-inflammatory medicines and anticoagulants, or the improper use of hormone medication, can cause menorrhagia.
- **Pregnancy complications.** A single, heavy, late period not during the usual time of menstruation may be due to a miscarriage. An ectopic pregnancy – when a fertilised egg is implanted within the fallopian tube instead of the uterus – also may cause menorrhagia.
- **Genetic blood-clotting disorders,** such as von Willebrand's disease, a condition in which an important blood-clotting factor is deficient or impaired, can cause abnormal menstrual bleeding.
- **Other medical conditions,** such as pelvic inflammatory disease (see section below under Pelvic Pain), thyroid problems, endometriosis (see section below under Pelvic Pain), and liver or kidney disease may cause menorrhagia.
- **Cancer of the reproductive organs,** including the uterus, cervix or uterus, in rare cases (see pg 142 for more on Cervical Cancer).

What you can do:

It is advisable to see your doctor if your periods last longer than usual or if you experience excessive bleeding. A significant complication of menorrhagia is iron deficiency anaemia, signs and symptoms of which include pallor, weakness and fatigue. You will be prescribed iron supplements if you're found to be anaemic, and may also be put on oral contraceptives

Warning:

A significant complication of menorrhagia is iron deficiency, otherwise known as anaemia.

or progesterone, or nonsteroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen, which can reduce heavy bleeding and menstrual cramps. If any fibroids or polyps are found, removing them will resolve the bleeding problem.

In extreme cases where the bleeding is debilitating and medication proves ineffective, your doctor may recommend inserting an intrauterine device (IUD) that releases the hormone progesterone. Hysterectomy, or surgery to remove the uterus, is seldom prescribed, as the procedure will result in sterility and the permanent cessation of periods. This surgery should only be done after a full discussion with your doctor and after careful consideration.

WHAT'S CAUSING YOUR PELVIC PAIN?

Our reproductive system functions normally most of the time. With age, as well as the stress of pregnancy and childbirth, problems can occur.

Pelvic pain that arises from the reproductive organs, typically perceived to be issuing from the area of the lower part of the abdomen located between the two hip bones, may be sharp or mild. Pain that is bad enough to interfere with your daily activities may be an indication of a problem with one of the reproductive organs (uterus, ovaries, fallopian tubes, cervix or vagina) in the pelvic area.

See a doctor if you notice any of the following:

- Menstrual periods change from being relatively pain-free to painful
- Pain interferes with your daily activities

- Severe pelvic pain occurs with or without vaginal bleeding
- Painful urination, blood in the urine, or an inability to control the flow of urine
- Blood in the stool or a significant, unexplained change in your bowel movements
- Pain during or after sexual intercourse

Aside from menstrual cramps, there are many causes associated with pelvic pain. Common gynaecological sources of pelvic pain include the following:

Fibroids

Fibroids (also known as leiomyomas, myomas, myofibromas, fibromas, or fibromyomas) are the most common type of growth found in a woman's pelvis. These are benign growths (non-cancerous tumours – see Chapter 8) developed from muscle tissue and attached to the muscular walls of the uterus during a woman's reproductive years. According to the Department of Obstetrics & Gynaecology at KK Women's and Children's Hospital, fibroids rarely develop into cancer (sarcoma).

The location, number, size and rate of growth of the fibroids differ from woman to woman. Those that grow inside the muscle wall of the uterus – called intramural fibroids – are the most common. Fibroids may grow as a single tumour, or in clusters of up to a hundred, and can range from pea-sized to large, round growths that are more than 15 cm wide that fill the pelvis or abdomen completely. They are a common occurrence among women, especially those between the ages of 30 and 50, although women in their 20s sometimes have them.

Causes

It is not clear what causes fibroids. Heredity is thought to be a possible factor, predisposing muscle cells in the uterus to develop into fibroids during the reproductive years.

An increased level of the female hormone

oestrogen produced by the ovaries from puberty onwards appears to be a possible stimulant for their growth. This might explain why fibroids usually grow during pregnancy and shrink during menopause, after which new ones tend not to develop. Hormonal drugs that contain oestrogen, such as birth control pills, may also cause fibroids to grow.

Signs & Symptoms

Many women with fibroids are not aware of it until they feel symptoms such as:

- Pelvic pain
- Abdominal distension
- Heavy or lengthy menstrual bleeding
- Difficult or frequent urination
- Constipation
- Pain or discomfort during sexual intercourse
- Reproductive problems, such as infertility, multiple miscarriages or early labour

Treating Fibroids

Unless they cause problems, fibroids can be left untreated and only need regular monitoring (2–3 times per year) by your doctor. But fibroids with non-minor symptoms, left untreated, can increase in size and may cause complications such as difficulty in conceiving, even miscarriage.

If necessary, fibroids can be treated medically or surgically. Treatment options for fibroids include:

- **Hormone therapy** such as gonadotropin-releasing hormone agonists (GnRH-a) halts the intrinsic production of hormones that may cause the fibroids to grow. Smaller fibroids cause fewer problems and are easier to remove surgically. However, this is only a “stop gap” measure before surgery, because it induces menopause and should not be used on a long-term basis.
- **Other medication to treat symptoms.** Tranexamic acid, birth control pills and anti-inflammatory medicines such as ibuprofen

and mefenamic acid may help to decrease the amount of menstrual blood flow.

- **Surgical treatment** for fibroids includes myomectomy to remove the fibroids, which preserves fertility but presents a 50% risk of regrowth if more than three fibroids are removed. Hysterectomy, the removal of the whole uterus, is the only permanent cure for fibroids, but this procedure results in permanent infertility.
- **MRI-guided ultrasound waves.** This is a new medical treatment to “kill” fibroids, and is suitable for women with only a few fibroids.

Polyps

Polyps are bulging growths in the lining of the uterus, called the endometrium. They are formed from the overgrowth of cells in the normal tissue lining the uterus, which then extend into the uterine cavity. They may also be found in the uterine cervix, and are usually benign (non-cancerous). Polyps are more common in women in their 40s and 50s, and can develop in both pre-menopausal and post-menopausal women.

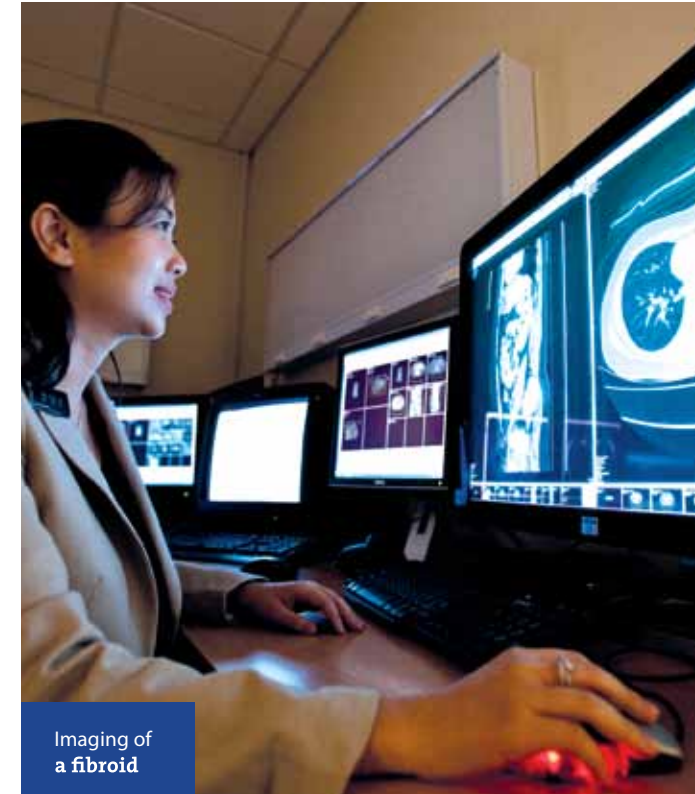
Causes & Risk Factors

Like fibroids, it is not clear what causes polyps. Being obese puts you at greater risk of developing polyps, as does hypertension. Having polyps may also cause you to have difficulty conceiving and puts you at higher risk of having a miscarriage if you're pregnant.

Signs & Symptoms

Although uterine polyps may not produce any symptoms, some women may experience problems such as:

- Irregular vaginal bleeding
- Bleeding after sexual intercourse
- Heavy menstrual bleeding



Imaging of a fibroid

Treating Polyps

Small polyps that don't cause any problems may resolve on their own and don't need to be treated, unless the risk of uterine cancer is present. Polyps causing heavy or irregular menstrual bleeding and/or containing cancerous cells will have to be removed surgically, via hysteroscopy – the insertion of a scope that allows visualisation of the uterine cavity from the inside. Polyps may recur after they have been removed. Curettage, a procedure in which the lining of the uterus is removed, can be used to address endometrial polyps in most cases.

Ovarian Cysts

Cysts refer to fluid-filled sacs that are not normal to the tissue where they are found. These can develop in any part of the body. Ovarian cysts are cysts that are found within or on the surface of an ovary. It is not uncommon for women to develop ovarian cysts at some time.

Ovarian cysts are divided into two broad categories: functional and non-functional. The most common ovarian cysts are functional (or physiologic) cysts – benign cysts that develop as part of the normal menstrual cycle mainly during a woman's

childbearing years. During each menstrual cycle, a follicle or normal fluid-filled sac grows on the ovary and holds the egg. When the egg is mature, the sac usually breaks and releases the egg during ovulation.

Follicular cysts, which are the most common type of ovarian cysts, develop when the follicle fails to rupture and release the egg but retains the fluid to form a cyst in the ovary. Also related to the menstrual cycle are corpus luteum cysts, which occur after an egg has been released from a follicle. The remaining area of tissue, known as a corpus luteum, usually breaks down and disappears if pregnancy doesn't occur, but may fill with fluid or blood and persist as a cyst with no symptoms, and usually only on one side of the ovary.

Non-functional cysts are caused by disease and include dermoid and endometriotic cysts (see "Endometriosis" below).

Signs & Symptoms

Most times, ovarian cysts don't cause any symptoms and are usually harmless. However, rapidly growing cysts that rupture or bleed may cause symptoms such as:

- Lower abdominal or pelvic pain shortly before or after menstrual period, during intercourse, or with strenuous movement. This may be in the form of constant, dull aching pressure or sudden and severe pain often accompanied by nausea and vomiting
- Abdominal distension
- Weight gain
- Irregular menstrual periods
- Frequent or difficulty urinating, in the case of large cysts
- Constipation or pain during bowel movements, in the case of large cysts
- Nausea and vomiting

Call for an appointment with a doctor if you have these symptoms, have severe pain or abnormal

bleeding, and if the following symptoms have persisted for at least two weeks:

- Getting full quickly when eating
- Losing your appetite
- Losing weight without trying

A cyst is usually detected during a physical or pelvic exam or during an ultrasound test.

Treating and Preventing Ovarian Cysts

There are three categories of treatment for ovarian cysts to consider:

- **Conservative therapy:** This involves having simple observation and regular ultrasound scans to monitor the size of the cysts.
- **Medical treatment:** The prescription of pain relief and hormonal medication, which regulate your periods and shrink the cyst at the same time, and prevent the formation of new ones.
- **Surgical methods:** Depending on your symptoms, the doctor may recommend the surgical removal of the cyst (cystectomy), or the cyst together with the ovary (oophorectomy) via a pelvic laparoscopy (keyhole surgery) or laparotomy. This may be followed by chemotherapy if the cyst is found to be cancerous. In cases where a large ovarian cyst goes untreated, it may become twisted, causing ovarian torsion and rupture suddenly, resulting in severe abdominal pain. Emergency surgery will be needed.

Endometriosis

Endometriosis is a condition where cells from the lining of the uterus are found outside the uterus instead, in areas such as on the ovaries, fallopian tubes, outer surfaces of the uterus or intestines, on the surface lining of the pelvic cavity, or on the bowels or bladder. These abnormal growths, called endometriosis implants, are benign (not cancerous), although they can cause problems.

Endometriosis is one of the most common gynaecological diseases. Some 30–40% of women

polycystic ovary syndrome



Polycystic ovarian syndrome (PCOS, or Stein-Leventhal Syndrome) is a common hormonal disorder where there is an imbalance of a woman's female sex hormones, resulting in an abnormal predominance of the male hormone androgen. It occurs in some 4–7% of women of reproductive age. The disorder is characterised by an irregularity in the menstrual cycle: the eggs in the follicles do not mature and are not released from the ovaries, but instead form very small cysts. The ovaries are often enlarged, with numerous small cysts present on the outside.

Causes & Complications

The exact cause of PCOS is not known, although it is likely to be the result of both genetic and environmental factors associated with abnormalities in insulin production and unusually elevated male hormone (androgen) levels. However, women with this disorder may have difficulty becoming pregnant due to infrequent or non-ovulation.

It is important for PCOS to be diagnosed early. Failure to do so can lead to complications such as diabetes, high blood pressure, heart disease, depression and snoring in the long term. In addition, there is also a small increased risk of cancer of the uterus.

Signs & Symptoms

Symptoms of PCOS may surface early on, at the start of menstruation, or may appear later on in the reproductive years. These include:

- **Abnormal menstrual periods.** This is the most common sign, whereby there is irregular or no menstruation, or prolonged periods of very light or very heavy menstruation.

Acne, together with abnormal menstruation, can be a sign of PCOS

- **Acne,** excess hair growth on the body (hirsutism), thinning of the hair on the head (male-pattern hair loss), decreased breast size and deepening of the voice. These symptoms are related to elevated androgen levels, which leads to virilisation (i.e. the development of male sex characteristics).
- **Oily skin**
- **Obesity and weight gain**
- **Elevated insulin levels and insulin resistance,** characterised by changes in skin pigmentation around the armpits, groin, neck, and breasts
- **Infertility**
- **High cholesterol levels**
- **Elevated blood pressure**

Treatment

Risks associated with PCOS may be minimised with proper treatment targeted at each of the manifest symptoms. These include:

- **Birth control pills** may be prescribed (especially to young women) to stimulate a normal menstrual cycle and combat the excessive male hormones, thereby reducing the risk of uterine cancer.
- **Weight loss** can also help to normalise menstrual cycles and increase the possibility of pregnancy, while reducing the risk of complications such as Type 2 diabetes and heart disease.
- **Fertility treatment** may be necessary if there is difficulty conceiving.



with endometriosis are infertile, making it one of the top causes of female infertility.

Causes & Risk Factors

While the cause of endometriosis has not been established, doctors believe that the condition may be caused by “retrograde menstrual flow” - the backflow of blood into the pelvis during menstruation. This leads to the cells of the lining in the uterus to be implanted outside of it.

There also appears to be a link to genetic factors. Oestrogen, a hormone involved in the female reproductive cycle, also appears to promote the growth of endometriosis. Women who have not given birth are at higher risk for it, as are those with a history of pelvic infection.

Signs & Symptoms

Most women with endometriosis don’t experience any symptoms at all, and having trouble getting

pregnant may sometimes be the first sign. Definite diagnosis of the condition is confirmed by surgery, usually laparoscopy.

Symptoms of endometriosis include:

- Extremely painful or heavy periods
- Irregular vaginal bleeding between periods
- Pain during or after sexual intercourse
- Pain when moving bowels
- Chronic pelvic pain, including the lower back and pelvic areas
- Chronic fatigue

Treating Endometriosis

Treatment for endometriosis can include:

- **Pain medication.** Medication from over-the-counter remedies to strong prescription drugs can be prescribed for mild pain and other symptoms.
- **Hormone therapy.** Ideal for endometriotic implants that are small or when there is minimal pain.
- **Surgery.** If endometriosis is extensive, or if there is severe pain, surgery is usually recommended.

For women with developed symptoms but who do not wish to become pregnant, endometriosis treatment usually involves medication, including hormone therapy and pain medication, to regulate menstruation and relieve pain.

Oral contraceptives (birth control pills) and nonsteroidal anti-inflammatory drugs (NSAIDs) can help relieve pelvic pain and menstrual cramping, while gonadotropin-releasing hormone analogs (GnRH-a) have also been effectively used to relieve pain and reduce the size of endometriosis implants. The latter induces menopause and its associated side effects, including hot flushes, tiredness, insomnia, headaches, depression, bone loss, and vaginal dryness (see next chapter on Menopause).

If symptoms are severe and not eased by medical therapy while fertility is desired, surgery

– without the removal of the uterus – may be needed to remove the abnormal endometrial implants. Endometriosis-related infertility is often treated successfully using hormones and surgery. As the chance of recurrence after surgery may be as high as 40%, oral medication are usually prescribed after surgery to help maintain symptomatic relief.

Pregnancy itself is a natural treatment for endometriosis, which also regresses and “burns out” on its own upon the onset of menopause. Women with endometriosis are often advised not to delay having children. The condition could likely worsen over time, which would further affect fertility.

Pelvic Inflammatory Disease (PID)

Pelvic inflammatory disease (PID) refers to the infection and inflammation of the female pelvic or reproductive organs, including womb lining (endometrium), uterus, fallopian tubes, cervix or ovaries. In extreme cases, abscesses can occur in the pelvis (tubo-ovarian abscess), and this may become a generalised infection, with potentially life-threatening consequences.

Note:

At least 60% of PID cases are due to the bacteria that cause two common STIs – chlamydia and gonorrhoea.

Acute inflammation and a delay in diagnosing PID or seeking treatment can lead to the scarring of the reproductive organs, which can cause infertility, increased risk of ectopic pregnancy (pregnancy occurring outside the womb), chronic pelvic pain and painful menstrual cycles. Repeated

episodes of PID (chronic PID) run a much higher risk of such complication. PID is the primary preventable cause of infertility in women.

The overall incidence of PID is estimated at 10–13 in every 1000 women, with the highest incidence at 20 in 1000 women between the ages of 15–24.

Causes & Risk Factors

At least 60% of PID cases are due to the bacteria that cause two common sexually transmittable infections (see section on STIs in this chapter) – chlamydia and gonorrhoea. The exposure of the cervix to these bacteria weakens its ability to prevent the spread of disease-causing organisms to the internal organs in the upper genital tract. Early treatment of STIs can help prevent PID.

In rarer instances, secondary PID can occur by infection that spread directly from other internal organs, the commonest being from an inflamed appendix in acute appendicitis. Other microbial infections as well as fungal infections in those with low immunity may also cause PID, while viral or parasitic infections are less common.

Factors associated with developing PID include:

- Previous diagnosis of an STI
- Being sexually active and under the age of 25
- Having multiple sex partners
- Lack of use of barrier method contraception, i.e. condoms
- Douching. This can push bacteria into the pelvic organs and cause infection. It can also hide signs of an infection.
- Use of an intrauterine device (IUD)
- Abuse of alcohol and recreational drug usage
- Smoking
- Having surgery and instrumentation of the womb, such as a hysteroscopy, abortion, dilatation & curettage (D&C), endometrial sampling, or evacuations for miscarriages

Signs & Symptoms

Mild cases of the condition often don't have any symptoms. In severe cases, there may be lower abdominal pain and fever. PID can come on fast with extreme pain and fever, especially if it's caused by gonorrhoea. It is often detected when women see their doctor when they experience difficulty getting pregnant, or when suffering from chronic pelvic pain.

Typical symptoms of PID include:

- Lower abdominal pain. This is the most common symptom.
- High spiking fevers or chills and trembling
- Foul-smelling, purulent, bloody vaginal discharge
- Irregular menstrual periods
- Abnormal vaginal bleeding, such as bleeding during or after sexual intercourse (post-coital bleeding)
- Nausea and vomiting
- Lower abdomen, cervical motion, and uterine and/or adnexal tenderness
- Pain in the upper right abdomen (rare)
- Vaginal discharge

Without treatment, PID can lead to severe problems such as infertility, ectopic pregnancy, and chronic pelvic pain. If you suspect a case of PID, consult a doctor right away.

Treating PID

The main treatment for PID is oral antibiotics to combat the bacteria and pain medication to ease the symptoms. Depending on the results of laboratory tests, the doctor will prescribe the appropriate type of antibiotics accordingly. If the symptoms fail to clear up within 2–3 days, or if you have an abscess in the fallopian tube or ovary, are pregnant or have low immunity, hospitalisation for intravenous antibiotics and/or surgery will be needed.

If you are diagnosed with PID, your sexual partner(s) also have to be treated, even if they may

not show any symptoms. Otherwise, infection will likely recur when you resume sexual activity.

GENITAL PROBLEMS

Many women experience minor vaginal problems occasionally. Some may clear with or without treatment. However if they persist, you should see your doctor.

Vaginal Discharge

Having a certain amount of vaginal discharge (the fluid that flows out of the vagina opening that is produced by glands in the vaginal wall and cervix) is normal. The appearance and amount of the discharge secreted by the vagina usually changes during the menstrual cycle, due to hormonal changes in the body. This normal fluid is usually clear or milky white, and without any unpleasant odour. During times of emotional stress, ovulation, breastfeeding and sexual arousal, it can turn thick and opaque. It may sometimes be accompanied by intense itching.

Signs & Symptoms

Abnormal discharge should be taken note of, as it may be an indication of infection or other disorders.

Signs to look out for include:

- An increase in the amount of vaginal discharge
- A change in the odour or consistency of the fluid
- Pain that accompanies vaginal discharge

Causes

The causes of abnormal vaginal discharge include: recent antibiotic use, yeast infections, bacterial vaginosis, PID, sexually transmitted infections (STIs) or the use of douches and scented soaps that may cause allergic reactions.

Prevention

Some methods to prevent infection include:

- **Eat yogurt** with live cultures or take *lactobacillus*

acidophilus tablets if you're on antibiotics.

- **Maintain good personal hygiene.** Keep your genital area clean and dry and avoid douching, which may actually worsen vaginal discharge by getting rid of healthy bacteria present in the vagina.
- **Wipe from front to back** after urination or bowel movement, so as to avoid spreading bacteria to the vagina.
- **Avoid wearing extremely tight-fitting clothes** such as skin-tight jeans or shorts, which may cause irritation. Avoid synthetic and silk underwear as these may restrict airflow and increase sweating in the genital area.
- **Use condoms during sexual intercourse** so as to avoid contracting or spreading sexually transmitted diseases.

If the discharge doesn't clear up after a few days, see a doctor who will prescribe a treatment depending on the cause of the problem.

Yeast Infection

Yeast infection or vaginitis is a common infection caused by yeast, or a fungus scientifically referred to as *candida*. Most women are likely to have an occasional bout of yeast infection.

Signs & Symptoms

Symptoms of yeast infection or vaginitis include:

- Itchiness, redness or pain around the vaginal and vulva (vulvitis)
- Whitish, cottage cheese-like, thick vaginal discharge
- Burning sensation or soreness
- Pain during sexual intercourse and/or urination

Treatment

A yeast infection may clear up on its own, but see your doctor if the symptoms persist. In most cases, you will be prescribed oral or topical antifungal medications, or antifungal vaginal tablets or suppositories to soothe the discomfort, although oral antifungal medications are not recommended for use during pregnancy. It may take up to two weeks for the treatment to work, and your doctor may also prescribe the same treatment for your partner to prevent reinfection.

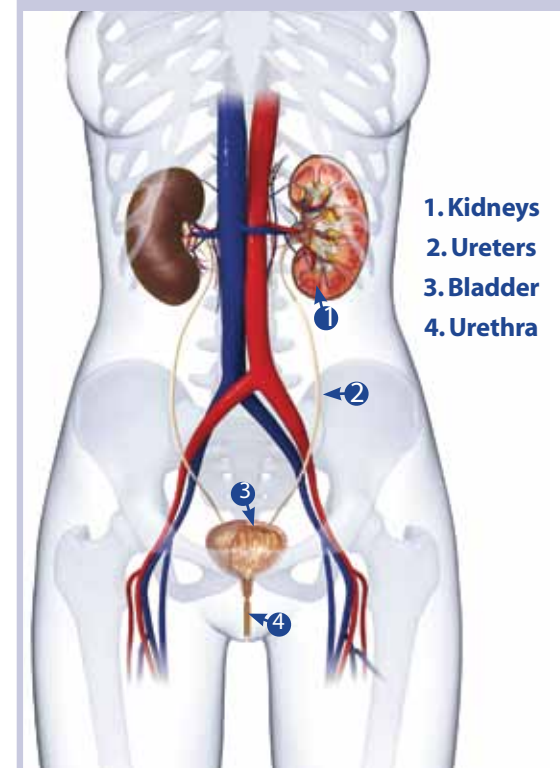
Urinary Tract Infection (UTI)

The urinary tract consists of the kidneys, ureters, bladder and urethra. A urinary tract infection (UTI) occurs when excessive bacteria grows in the urinary tract, most commonly in the lower urinary tract (bladder and urethra), a condition known as cystitis. *E. coli*, a common pathogen that crosses over from the anal region, accounts for a whopping 85% of all UTI.

UTIs are the second most common type of infection in the body. Women are more prone to UTIs

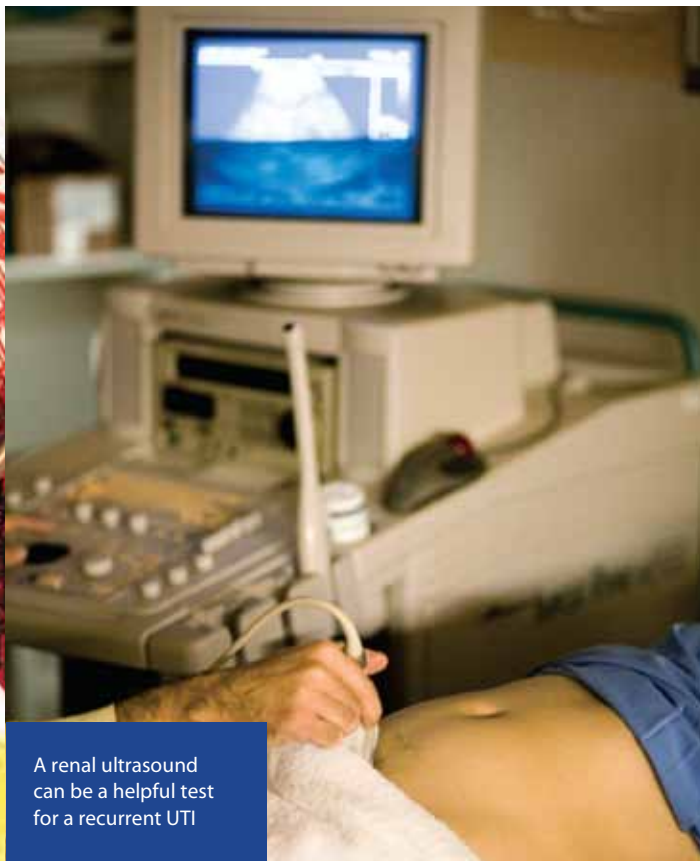
The Urinary Tract

The urinary tract consists of the kidneys, ureters, bladder and urethra.





The bacteria *E. coli* accounts for more than 80% of all UTIs



A renal ultrasound can be a helpful test for a recurrent UTI

recurrent UTIs

A recurrent urinary tract infection (RUTI) is described as symptomatic infection occurring after the apparent cure of a previous UTI, typically more than twice over a six-month period. Two-thirds of all RUTI have been found to be due to the same strains of *E. coli* despite adequate treatment.

The mainstay investigations for diagnosing UTI include urinalysis or urine culture; where microscopy looks for white blood cells, red blood cells, the presence of nitrites and leukocytes, and bacteria that point to a UTI. The culture identifies the specific bacteria causing the UTI, and indicates a specific antibiotic that can be used to treat the UTI. An alkalinising agent may also be administered concurrently to make the urine more hostile to bacteria.

In RUTI, further tests are required, which include the following:

- **Renal ultrasound:** To look at the kidneys

- **Abdominal X-ray:** To detect urinary tract stones
- **Urine culture:** To test for tuberculosis
- **Urine cytology:** To assess for any cancerous cells in the urinary tract (which most commonly presents with blood in the urine)
- **Cystoscopy:** A specialised camera is inserted through the urethra to look for abnormalities such as stones and tumour in the bladder.

Treatment for RUTI typically includes antibiotics for the longer term, or stronger antibiotics, although follow-up urine culture is necessary to “test-for-cure”. If left untreated, the infection can spread upwards to the kidneys, leading to renal infection and increasing the risk of renal failure or permanent damage.

In extreme situations, bacteria may spread via the bloodstream, leading to a generalised body-wide infection or septicaemia (blood-poisoning), which may be fatal in certain cases.

than men, which is likely due to their having shorter urethra (the tube that carries urine out from the bladder during urination), which makes it easier for bacteria to move up to the bladder. The urethral opening in women is also nearer sources of bacteria from the anus and vagina.

According to the Department of Urogynaecology at KK Women’s and Children’s Hospital, as many as one in two women will experience at least one UTI during their lifetime. About one in five women between the ages of 20–65 will suffer at least one attack every year, and 3% of the cases turn into chronic recurrent UTI (RUTI).

Risk Factors

Some factors that increase women’s risk of developing UTI include:

- **Age.** The rate of UTIs in women gradually increases with age
- **Incomplete bladder emptying**, which allows the residual urine to be infected by bacteria present. Causes include:
 - Pregnancy: About 15% of pregnant women will experience UTI
 - Bladder, uterine or any other pelvic organ prolapse
- **Sexual intercourse** is a common trigger for UTI infection in many women via the physical action that exposes the urethra to bacteria
- **Use of diaphragm and condoms with spermicidal foam** as contraceptives
- **Immunosuppression** with certain medication or drugs
- **Diabetes**
- **Menopause**, with the attendant loss of oestrogen
- **Abnormalities of the urinary tract**, such as the presence of kidney or renal stones
- **Instrumentation of the urinary tract**, such as catheterisation or cystoscopy

Signs & Symptoms

Early recognition and adequate treatment of UTI is necessary to prevent complications.

Signs to look out for include:

- Painful, burning sensation during urination (dysuria)
- Frequent urination and the feeling of urgency to urinate even when there’s little urine
- Cloudy, dark, foul-smelling or bloody urine
- Discomfort in the lower abdomen
- Fever, tiredness or shakiness
- Nausea or back pain (signs of renal infection)

Seek treatment if the infection doesn’t clear up in a few days. The infection is normally confined to the bladder, but may spread to the kidneys, which is serious and may cause permanent damage.

Treating & Preventing UTI

The main treatment for urinary tract infection is antibiotics, together with an adequate intake (3–4 litres a day) of water and other fluids.

Drinking cranberry juice is also believed to help prevent infection, as it contains certain enzymes that help reduce the chance of bacteria sticking to the bladder skin lining, which leads to infection. Probiotics (live culture yoghurt) have also been shown to reduce the chance of getting UTI, as “good” live bacteria is introduced into the bowels of patients and reduces the chance of the “bad” bacteria in our bowels spreading and causing UTI.

UTIs can be prevented by ensuring proper personal hygiene and regular emptying of the bladder. As the source of the bacteria comes from the bowels, it is also vitally important to clean from front to back after defecation to avoid faecal contamination of the vaginal region.

Regular, daily cleansing of the genital area with water is encouraged, especially before and after sexual intercourse, but avoid the overzealous use of

vaginal cleansers to reduce the chances of getting UTI. Urination after sexual intercourse also helps flush away urine possibly contaminated with bacteria. All active vaginal infections should also be treated, or bacteria may spread on to the urinary tract.

Urinary Incontinence

Urinary incontinence is a pelvic floor disorder, which refers to a problem with muscles or the surrounding tissues that keep all of the pelvic organs (bladder, uterus, and rectum) in place. Incontinence is characterised by the inability to prevent the loss of urine (water and waste products removed by the kidneys) from the bladder.

While women are twice as likely as men to suffer from incontinence because of pregnancy, childbirth, menopause, and the structure of the female urinary tract, it can also come about as a result of obesity, neurological injury, birth defects, stroke, multiple sclerosis, and physical problems associated with

ageing. Although it happens more often in older women, urinary incontinence is a medical problem that *can* be treated, and should not be seen as something that is part and parcel of ageing.

The severity of the problem can range from an occasional leakage of urine when one coughs or sneezes, to sudden and unpredictable episodes of urine leakage – from being a slightly cumbersome problem to being an utterly debilitating source of public embarrassment and deterrence from social activities and engagement. Most bladder control problems are due to weak or overactive muscles. Different types of urinary incontinence include:

- **Stress urinary incontinence (SUI):** When the bladder neck or urethral muscles are weak, often as a result of physical changes owing to pregnancy, childbirth or menopause, it may cause leakage as a result of physical exertions that increase intra-abdominal pressure, such as laughing, chronic coughing, sneezing, or heavy lifting. According to the Department of Urogynaecology at KK Women's and Children's Hospital, this is the most common type of urinary incontinence, affecting half of all women with urinary leakage.
- **Overactive bladder syndrome (OAB):** According to the Department of Urogynaecology at KK Women's and Children's Hospital, this occurs in 40% of women with urinary leakage, with approximately 10% of the general population having this type of urinary incontinence. OAB tends to increase with age, and is more common in menopausal women, those with spinal cord injuries, previous pelvic surgery, diabetes mellitus, multiple sclerosis, or pelvic radiation treatment, although it is often idiopathic (with no identifiable cause). Symptoms of OAB include:
 - Sudden and overwhelming need to urinate (urgency)
 - Urinating more than seven times during the day (frequency)

- Waking up more than once in the night to urinate (nocturia)
- Urine leakage if unable to reach the toilet in time (urgency urinary incontinence, or UUI)
- **Overflow incontinence:** A weakened or damaged bladder that overfills with urine results in poor urine stream, possible dribbling and a sensation of not completely emptying the bladder. It can also be caused by diabetes and spinal cord injury.
- **Functional incontinence:** Physical and medical conditions that interfere with thinking, moving, or communicating and hence getting to a toilet in time in those that otherwise have normal bladder control. This is common among the aged. Causes include arthritis, Alzheimer's disease, or being wheelchair-bound.
- **Transient incontinence:** A temporary episode of urinary incontinence that can be triggered by:
 - Certain medications
 - Urinary tract infection (UTI; see section above)
 - Mental impairment
 - Restricted mobility
 - Severe constipation
 - Ignoring bladder needs and postponing going to the toilet for too long
- **Mixed incontinence:** A combination of stress incontinence and urge incontinence symptoms, with typically one particular type predominating.
- **"True" incontinence:** Classically caused by a fistula, an abnormal connection between the urinary tract and the vagina. Can be caused by difficult childbirth, surgery, radiation therapy, or certain diseases.

Treating Incontinence

Treatment for urinary incontinence can vastly improve the quality of your life, so seek help early. Treatment options include physiotherapy with regular pelvic floor exercise (PFE, also known as Kegel exercises – see box on next page) to strengthen the pelvic floor muscles, bladder retraining methods,

controlling fluid intake, medicines, electrical stimulation and special medical continence devices.

In cases of SUI, a tension-free vaginal tape obturator (TVT-O) operation offers excellent results. In cases of severe and unremitting OAB, there is the option of surgery, but this is the last resort and should be carefully discussed with experienced and skilled specialists.

Pelvic Organ Prolapse

Pelvic organ prolapse is a pelvic floor disorder, which results from the deterioration or relaxation of supporting tissues (pelvic floor) around the pelvic organs (bladder, uterus, and rectum), which then descend or drop (prolapse) from their normal positions, causing problems.

Types of pelvic organ prolapse include:

- **Cystocele (bladder prolapse).** The bladder is no longer supported and descends into the vagina, causing urinary difficulties and stress urinary incontinence (SUI – see previous section). This is the most common type of prolapse in women.
- **Uterine prolapse.** This occurs when the womb (uterus) drops down the vagina. It is the second most common type of prolapse.
- **Rectocele (rectal wall prolapse)**
- **Enterocoele (prolapse of the small bowel)**
- **Vaginal vault prolapse**

Risk Factors

The risk of pelvic organ prolapse increases with:

- Factors that lead to pelvic floor relaxation or deterioration, such as pregnancy, vaginal delivery and menopause
- Conditions that increase and cause chronic pressure in the abdominal cavity, such as chronic cough, asthma, constipation, carrying heavy objects or loads, and obesity
- Previous pelvic surgery

Urinary incontinence occurs more frequently in older women, especially those with other physical problems

what are Kegel exercises?

Kegel exercises, the more commonly known term for pelvic floor exercise (PFE), are exercises designed to increase muscle strength and elasticity in the female pelvis.

To identify your pelvic floor muscles, do either one of these two tests:

1. As you urinate, try stopping the flow of urine midway. You are contracting your pelvic floor muscles to stop the urine flow. Then relax your pelvic floor muscles to completely empty your bladder.
Do this test once a week to check if your pelvic floor muscles are getting stronger. The stronger they are, the quicker you will be able to stop the urine flow.
2. Insert one finger in your vagina. Contract your pelvic floor muscles and feel the grip around your finger.

How to perform Kegel exercises

1. Sitting or standing upright with thighs slightly apart, simultaneously tighten the urethra, vagina and anus.
2. Lift and draw up the pelvic floor muscles inside you. Hold this squeeze and lift for 5–10 seconds. For a start, you may only be able to hold the contraction for 1–2 seconds. Over a period of weeks, aim to gradually increase contraction time to 10 seconds.
3. Let go slowly and rest for 10 seconds before starting on the next contraction.
4. Repeat four times.
5. Now do five short, fast but strong contractions.
6. Do this exercise routine at least three times every day. Slowly increase the repetitions to 10 holding contractions and 10 fast contractions.

You are never too young or too old to exercise your pelvic floor. Do it on a daily basis, and whenever you are sitting or standing, e.g. while waiting for the bus, waiting at the traffic lights or standing in a queue.

Signs & Symptoms

The signs and symptoms of pelvic organ prolapse depend on the degree of prolapse. They include:

- Feeling a sense of heaviness in the vagina
- Pelvic discomfort
- Seeing or feeling of protrusion of the uterus and cervix through the vaginal opening
- Difficulty having sexual intercourse
- Lower back pain
- Chronic vaginal discharge or bleeding, resulting from repeated injury to the prolapsed organ in severe cases
- Enlarged ureters and kidneys, in cases of severe utero-vaginal prolapse or cystocele

Treatment

The treatment for pelvic organ prolapse depends on

age, prolapse severity, underlying medical diseases, and whether childbearing has ceased.

The most popular conservative or non-surgical treatment is regular pelvic floor exercise (PFE) or Kegel exercises (see box above) that can help to strengthen the pelvic floor muscles and slow down the progression of the prolapse. PFE may improve the condition in the short run, but does not cure it, as prolapse will worsen once PFE is stopped. It is only suitable for milder degrees of prolapse.

Those with severe pelvic organ prolapse but are not suitable for or do not want surgery may have a vaginal pessary fitted to support the prolapsed organ and for symptomatic relief. Regular pelvic examinations every 3–4 months will be required.

Surgery is the definitive form of treatment. There are many surgical options available, depending

on the type and severity of the condition. These include: a vaginal hysterectomy for utero-vaginal prolapse, sacrospinous ligament fixation for vault or severe uterine prolapse, and pelvic floor repair for vaginal wall prolapse (e.g. cystourethrocoele or rectocele), which reduces unsightly bulges and discomfort. For severe cases, where there is a high chance of recurrence in the future, a synthetic mesh may be used to support the prolapsing organ(s).

Whilst abdominal or laparoscopic surgery is possible, vaginal prolapse surgery has the advantage of the absence of a scar on the abdomen and a lower level of pain experienced by patients during the post-operative period.

The type of surgery should be decided in consultation with a urogynaecologist, who will be able to assess the risks and complications involved, anaesthesia required, as well as post-operative management.

SEXUALLY TRANSMITTED INFECTIONS (STIs)

Sexually transmitted infections (STIs) are infections that are contracted through sexual contact, which includes kissing, oral-genital contact, and the use of shared sexual “toys” such as vibrators. They can also be spread by the direct contact of broken skin with open sores, blood or discharge, via blood transfusion, or the use of contaminated needles in drug users.

The causes of STIs are bacteria, parasites and viruses. STIs caused by bacteria or parasites (e.g. chlamydia, gonorrhoea, syphilis) can be treated with antibiotics or other medicines, but many STIs caused by viruses such as Hepatitis B, Hepatitis C and HIV have yet to have a cure. Antiviral medications can sometimes help to speed up recovery and keep the symptoms of STIs under control, while the correct usage of latex condoms can greatly reduce (although not eliminate) the risk of contracting or spreading STIs. As a preventive measure, you may immunised against Hepatitis B.

In most STIs, the signs and symptoms usually show up on or around the sex organs. Some of these include:

- Vaginal discharge and/or vulval itching
- Abdominal pain
- Pain during sex or when urinating
- Small, painful ulcers or blisters that turn into scabs on the genital area
- Flu-like symptoms, including swollen glands, fever and body aches
- Painless, soft, flesh-coloured warts or growths around the genital area

In women, there are often no symptoms at all, and the health problems can be quite severe. This can be dangerous – if left untreated, STIs can spread from the sex organ to other parts of the body, causing serious and potentially life-threatening complications. It might be spread to others through sexual contact, while pregnant women may also spread the disease to the baby during pregnancy or at childbirth. Women in the high-risk group, such as those with multiple sexual partners or risky sexual practices, should consult a doctor.

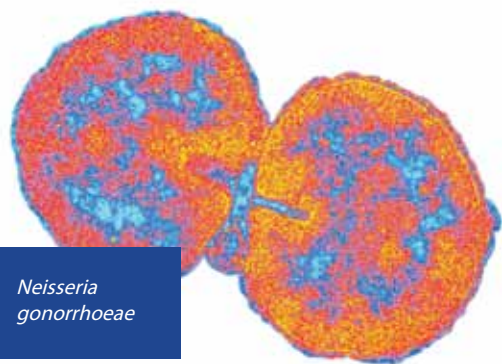
The most prevalent STIs among Singaporean young women are gonorrhoea and chlamydia. Common STIs include:

Gonorrhoea

Gonorrhoea is a very common disease spread through contact with the penis, vagina, mouth or anus. It is caused by *neisseria gonorrhoeae*, a bacterium that thrives in the warm, moist areas of the genital tract, mouth, throat, eyes and anus.

Signs & Symptoms

The signs and symptoms of gonorrhoea usually appear between 2–10 days after sexual contact with an infected person, but tend to be non-specific in women. It is often mistaken for a bladder or vaginal infection.



Neisseria gonorrhoeae

Initial symptoms include a painful or burning sensation when urinating, increased and/or bloody vaginal discharge, or vaginal bleeding between periods. Symptoms of rectal infection may include discharge, anal itching, soreness, bleeding, or painful bowel movements.

Complications

The symptoms of gonorrhoea may go away without treatment, but the bacteria remains in the body. This is why it is important to seek treatment.

Gonorrhoea is also a common cause of pelvic inflammatory disease (see section on PID on pg 91) in women, which can lead to complications such as chronic pelvic pain, affect the reproductive organs and may even lead to infertility. It is also a cause of blindness, as well as joint and blood infections in babies who contract it from their mothers at birth.

Left unchecked, gonorrhoea can spread through the bloodstream to other parts of the body including joints, brain and the heart, which can become life-threatening, as well as put sufferers at greater risk of being infected by the human immunodeficiency virus (HIV) and other STIs.

Treatment

The typical treatment prescribed for gonorrhoea is a course of antibiotics, although in many parts of the world, treatment of gonorrhoea is becoming more difficult because of drug-resistant strains. The correct use of latex condoms and practising safe sex can reduce the risk of catching or spreading the STI.

Syphilis

Syphilis is a bacterial infection usually spread through direct contact with syphilis sores (ulcer) on the body of an infected person carrying the bacterium *treponema pallidum*. The painless sores usually develop on the external genitals, vagina, anus, lips and tongue, and can show up anytime from 10 to 90 days later.

Signs & Symptoms

Depending on the stage of infection, the signs and symptoms of syphilis vary:

- **Primary stage:** Painless, firm and small sores that last 3–6 weeks within the first or primary stage. These usually appear at the location where the bacterium entered the body and typically heal without treatment.
- **Secondary stage:** The appearance of a rough, reddish brown rash on one or more areas of the body, including the palms and the soles. Other symptoms may include fever, swollen lymph glands, sore throat, patchy hair loss, headaches, weight loss, muscle ache and fatigue.
- **Latent stage:** If secondary syphilis is left untreated, the infection remains dormant in the body, sometimes for years.
- **Late stage:** In the late stages of syphilis, the disease may have damaged vital organs such as the heart, blood vessels, brain, nerves, eyes, liver, bones and joints. Complications such as meningitis, stroke, dementia and heart disease may occur with serious consequences – even death.

Complications

Syphilis sufferers have a greater risk of HIV infection because of the existence of open sores. An infected mother may pass the infection to her unborn baby during pregnancy, causing birth defects such as mental retardation or seizures, and is also at higher risk of miscarriage, stillbirth and premature birth.

Treatment

Syphilis is treated with antibiotics, and treatment is especially successful in its early stages.

Chlamydia

Chlamydia is an infection spread through vaginal, anal, and oral sex with an infected person carrying the bacterium *chlamydia trachomatis*. It can also spread from an infected mother to her baby during vaginal delivery.

Risk Factors

The risk of infection increases with risky sex practices. According to the Health Promotion Board, Singapore, sexually active teenage girls and young women are more prone to develop chlamydial infection, as the opening of the uterus (cervix) has not fully matured. This also increases their risk of developing other STIs, such as gonorrhoea and syphilis.

Signs & Symptoms

The signs and symptoms of chlamydia are mild, and often show up within 1–3 weeks later, although some sufferers may not develop any symptoms at all. These include a yellowish-white vaginal discharge, mild burning sensation during urination, painful sexual intercourse, lower abdominal or back pain, and/or bleeding after sexual intercourse or between menstrual periods.

Complications

Chlamydia can cause PID (see section on PID on pg 91) without any symptoms in up to 40% of women, which may in turn cause chronic pelvic pain, infertility and ectopic pregnancy (pregnancy outside the womb). Infection during pregnancy can result in premature delivery and stillbirth. An infected mother can also pass the infection on to her baby during vaginal delivery, resulting in infections such as pneumonia or conjunctivitis.

According to the Health Promotion Board,

Singapore, chlamydia sufferers are up to five times more at risk of acquiring HIV infection than non-sufferers. Chlamydial infection can spread to the rectum as well, resulting in inflammation, discharge and pain.

Treatment

Chlamydial infection can be effectively treated with antibiotics, with the infection usually resolving within 1–2 weeks.

Genital Herpes

Genital herpes is a highly contagious, common viral infection caused by a strain of herpes simplex virus (HSV). It is primarily spread through sexual contact.

Signs & Symptoms

The signs and symptoms of genital herpes appear about 2–10 days after sexual contact with an infected person and may be mild or indiscernible. These include itching or burning sensation in the genital area, vaginal discharge, and small sores or blisters in or near the vagina.

Complications

Genital herpes is a self-limiting infection and infection that recurs is incurable. The sores may heal after a few days, but may recur for years after that, although the episodes of breakout tend to lessen with time. A woman with genital herpes may infect her baby at childbirth, causing blindness and mental retardation.

Treatment

Treatment with antivirals helps to speed up the healing of sores and relieves pain and discomfort, but cannot prevent recurrence.

Genital Warts

Genital warts, also known as venereal warts, is one of the most common STIs in Singapore and

worldwide. 90% of all genital warts are caused by the human papilloma virus (HPV), which also causes 70% of all cervical cancers. The infection is transmitted by skin-to-skin contact during vaginal, oral and anal sexual intercourse with an infected partner.

Signs & Symptoms

As most people may not have any signs and symptoms, the infection often may go unnoticed. Genital warts appear within three months of sexual contact with an infected person. The warts appear as soft, pink cauliflower-like growth or flesh-coloured bumps on the vagina or around the anus that may cause itching, pain and a burning sensation.

Complications

Having genital warts may increase the risk of cervical cancer. Those infected with genital warts are advised to go for regular Pap smears. In addition, it may also cause problems during pregnancy such as difficulty in urination as a result of the expanded warts, and obstructed delivery as a result of warts on the vaginal wall (birth canal).

Treatment

There is no treatment for the virus itself, only those for alleviating and treating the diseases caused by HPV.

HIV/AIDS

Acquired immune deficiency syndrome (AIDS) is a disease caused by the human immunodeficiency virus (HIV). It is spread through sexual contact with an HIV-infected person, contaminated needles and blood. A woman with HIV/AIDS can infect her baby during pregnancy, at childbirth or through her breast milk.

Signs & Symptoms

Many people after contracting HIV may have no symptoms for years, and can take up to 10 years to

develop AIDS, the end stage of HIV infection. Some symptoms that may be experienced include:

- Tiredness
- Weight loss
- Prolonged fever
- Night sweats
- Skin rash
- Persistent diarrhoea
- Lowered resistance to infections

Complications

Over time, the virus attacks the body's immune system, causing AIDS sufferers to be susceptible to all kinds of infections, which can be life-threatening. It also increases the severity of some common diseases and conditions as well as the risk of getting some cancers.

Treatment

There is no cure for HIV/AIDS. It is a fatal disease. A person with AIDS usually dies between one and a half to three years after developing AIDS, usually from infection or cancer. However, treatment can delay the progression of the disease.

Treating STIs

If you suspect that you may have contracted STI, seek medical help early. Different STIs require different treatments. Self-medication is not advisable, as it may lead you to think that you've been cured when you're not. To prevent the recurrence of infection, make sure that your partner seeks treatment as well.

BIRTH CONTROL

Birth control or contraception allows you to prevent pregnancy, plan the number of children you want to have, and the time span between each of them. There are many safe and effective birth control methods available. It's up to you to choose a method that will best suit your needs and preferences.

No matter what method of birth control you choose, it is important to know how it works, how to use it, and the possible side effects. Your choice of birth control should depend on factors such as your health, frequency of sexual activity, number of sexual partners, and your desire to have children in the future.

Contraception can be used until menopause – when a woman has not had a period or any menstrual bleeding for two years if aged under 50, and for one year if over 50.

Birth control works in different ways. These include:

- Keeping the sperm from reaching the egg in the uterus
- Killing or damaging the sperm
- Stopping ovulation and preventing the ovaries from releasing eggs each month via hormonal intervention
- Thickening the mucus in the cervix so that sperm cannot get through
- Altering the lining of the uterus to prevent implantation of the fertilised egg
- Preventing sperm and egg from meeting

Barrier Method

This barrier method prevents conception by keeping the sperm from entering the vagina to fertilise the egg.

Examples of contraception using this method are:

- **Condoms:** These are thin, rubber sheaths worn over erect an penis during sexual intercourse. Apart from preventing conception, condoms also provide protection against sexually transmitted diseases. They must be used correctly to be effective.

The advantages to this method are that it is reversible and highly simple to use, and can also be easily procured from commercial retail outlets. It also offers protection against HIV/AIDS and other STDs (see previous section on STDs).

Contraceptive injections are almost 100% effective

Birth control pills are easy to use and can help manage PMS symptoms

morning after pill

If you've had unprotected sex or suspect that the contraceptive method has failed (e.g. the condom slipped or broke) and require emergency contraception, you can take what is known as the "morning after pill". It works in much the same way as regular birth control pills – by preventing or delaying ovulation, blocking fertilisation, or keeping a fertilised egg from implanting in the uterus.

Although it should be taken within three days of unprotected sex, taking it sooner (without having to wait till the next morning) will reduce your chances of pregnancy. Emergency contraceptives work best when taken within the first 24 hours after intercourse.

An alternative emergency contraception relies on the insertion of a copper-releasing intrauterine device (see previous section on IUD in this chapter) within 5 days of unprotected intercourse. This can be removed after your next period, or left in place to provide ongoing contraception. This method reduces the risk of pregnancy by 99.9%.

Emergency contraception may be used following many different situations, including:

- After intercourse in which no birth control method is used
- Sexual assault or rape
- When a condom breaks or a diaphragm slips out of place
- When a woman forgets to take birth control pills

Do note that the side effects associated with regular hormonal contraception methods such as the birth control pill and IUD apply for emergency contraception as well. However, emergency contraception is no way as effective or safe as regular contraception, and shouldn't be used as a permanent substitute or contraceptive solution.

The disadvantages? It interrupts intercourse, and the latex or chemicals may cause urinary tract infections (see previous section on UTI in this chapter) and allergic reactions.

Effectiveness: 75% when used correctly, 90% when used with spermicide

- **Sponge, diaphragm and cervical cap:** These three methods of birth control work by covering the cervix or entrance to the womb and preventing the sperm from entering. These are fitted by the doctor, and should be inserted into the vagina by the user and left in place eight hours after intercourse. For better protection, the diaphragm and cervical cap should be used together with spermicide.

The advantages to using these contraceptives are that they are safe to use and reversible, with no physical side effects. The disadvantages: they may become dislodged before or during intercourse, and the latex or chemicals in these contraceptives may also cause UTI and allergic reactions.

Effectiveness: Good protection when used correctly, 85% when used with spermicide.

- **Spermicide:** Chemicals in the form of foam, cream or suppository to be inserted in the vagina before intercourse to kill or disable sperm. May be used on its own or on a condom or diaphragm. Some women experience genital irritation from the use of spermicide.

The advantages to using spermicides: it is simple to use and also acts as a lubricant at the same time, and can be easily procured from pharmacies. The disadvantages are potential difficulties with application and allergy issues.

Effectiveness: 70% on its own. Should be used with any of the other methods above, such as a condom or diaphragm.

Hormonal Methods

Hormonal methods work by preventing ovulation and changing the lining of the uterus via increasing the levels of female hormones progesterone and/or oestrogen in the body. They also cause the cervical mucus to thicken, making it hard for the sperm to get through the cervix.

Hormonal methods come in several forms:

- **Birth control pills:** Most birth control pills contain the synthetic hormones progestogen and/or oestrogen. For the pill to work, it has to be taken every day.

The advantages to this hormonal method are that it is effective, safe and easy to use.

Health benefits include helping to regulate the menstrual cycle, manage PMS and PMDD symptoms (see section on PMS), improve oily skin and acne, and also reduce the risks of ovarian and endometrial cancer.

While contraceptive pills today contain very low doses of hormones to minimise side effects, common side effects include nausea, headache, breast tenderness, spotting between periods, weight gain and mood swings. Rare but serious side effects include increasing the risk of stroke, blood clots, high blood pressure, heart disease and breast cancer. Oral pills are not recommended for women who smoke, and do not protect against STDs.

Effectiveness: 99% if taken as instructed.

- **Contraceptive injections:** Hormone injections work by suppressing ovulation with a synthetic progesterone hormone. These can be given at monthly or three-monthly intervals. Side effects are similar to oral pills. After about a year of use, many women may not have periods. Periods usually resume when the injection is stopped.

Advantages to using the injection method are that it's safe, highly effective, long-lasting,

easy to use and does not interfere with sexual intercourse. Disadvantages are that some women may experience irregular menstrual cycles and weight gain, and may have problems conceiving for 6–12 months after stopping the injections.

Effectiveness: Almost 100% effective.

- **Contraceptive implant:** A small, matchstick-sized plastic rod containing synthetic progesterone is inserted under the skin in the inner upper arm to prevent ovulation. Once inserted, it provides protection against pregnancy for three years.

The contraceptive implant is almost 100% effective, and is a "fit and forget," reversible contraceptive method. Possible side effects include headaches, acne, weight gain and, most commonly, irregular vaginal bleeding, which should stop after 6–9 months.

Effectiveness: Almost 100% effective.

- **Intrauterine device (IUD or IUCD):** The IUD prevents the fertilised egg from attaching to the wall of the womb (i.e. implantation). It is inserted into the uterus by a doctor.

There are two types of IUD: non-medicated ones that contain copper, and hormonal ones that contain progestin (synthetic progesterone), which is released into the uterus to prevent conception. In the same way, the copper IUD releases a small amount of copper into the uterus, which prevents the egg from being fertilised and the embryo from implantation.

The non-medicated device is effective for a period of between 3–5 years. The hormonal IUCD is effective for up to five years, although monthly checks on the proper functioning of the device is required. Common side effects of copper IUD include menstrual pain, vaginal discharge and heavy bleeding, which is reduced with the hormonal IUD. Some users stop menstruating completely while using the hormonal IUD.

The IUCD is a reversible contraceptive method

that is safe and effective, and does not interfere with sexual intercourse. Disadvantages include the possibility of infections in the uterus or fallopian tubes, which can lead to scarring, making it difficult to conceive after that. In rare cases, the IUD can perforate the wall of the uterus.

Effectiveness: 98% effective.

Natural Methods

Natural methods or fertility awareness-based methods of contraception work by recognising the signs of ovulation and abstaining from sex during the fertile period. They are normally used by women who cannot use other contraceptive methods. These methods of contraception are generally not as reliable, and should be combined with another method of contraception, such as a condom or diaphragm, for more effective results.

The natural family planning method requires the ability to estimate as accurately as possible the date of ovulation via daily recordings and observations, and hence relies on the regularity of the menstrual cycle, which may be affected by anxiety, stress or illness.

The symptothermal method of estimating the date of ovulation involves keeping track of cervical mucus signs, waking temperature (basal body temperature), and menstrual cycle history:

- **Rhythm method:** For this method of determining your menstrual cycle and patterns, you need to count back 14 days from the first day of your last period. Take that as the day you ovulated and will ovulate the following month. Your fertile period is taken to be seven days before and after ovulation (see BBT chart). Users of this method should have regular periods.
- **Basal body temperature (BBT) method:** This method identifies the fertile period by taking your temperature with an ovulation

thermometer first thing every morning before getting out of bed. BBT is the body temperature of a person at complete rest. A woman's BBT rises by 0.2–0.4°C after ovulation. Refrain from sexual intercourse from the first day of the menstrual cycle until after recording a rise in BBT for three consecutive days. The accuracy of this method is reduced when having a fever, and/or when temperature changes are not obvious. It's reliant upon the initial resting temperature of the body.

- **Cervical mucus/billings method:** A woman's cervical mucus changes during her menstrual cycle. This method, also known as the ovulation method, requires the ability to understand one's menstrual pattern and identify the changing cervical secretions, distinguishing mucus from semen and other discharges caused by infection and lubrication.
 1. During the first few days of menstruation, there is hardly any mucus. These days are safe for sex, as ovulation is most unlikely.
 2. After the first few days, the woman may have thick or sticky, cloudy or yellowish mucus that does not stretch. When this happens, she should not have sex.
 3. A few days later, the mucus becomes clearer, feels slippery and can be stretched between two fingers. The last day of this type of mucus is called the peak day and coincides with ovulation, the most fertile period. On this day, the mucus is the most stretchable.
 4. After that, the mucus decreases and becomes sticky again. Avoid sex till three days after the last day of these "fertile" secretions.

Sterilisation

Sterilisation is a permanent method of preventing pregnancy. Surgical sterilisation is available in the form of tubal ligations for women and vasectomies for men.

Ligation is an operation where the fallopian

tubes are cut or tied so that the egg is unable to travel down the tubes to meet the sperm, preventing fertilisation. Some women choose to undergo ligation right after delivery. The procedure is safe and simple, with no side effects. The surgery may also be performed at the same time as a caesarean birth or abortion. Sexual intercourse can be resumed when the wound heals (usually within a week).

Sterilisation is a major decision that should be made with care. Those who have this procedure must be sure of not wanting to have any more children. Reversing the procedure requires major surgery and is not always effective.

Effectiveness: Almost 100% effective.

INFERTILITY

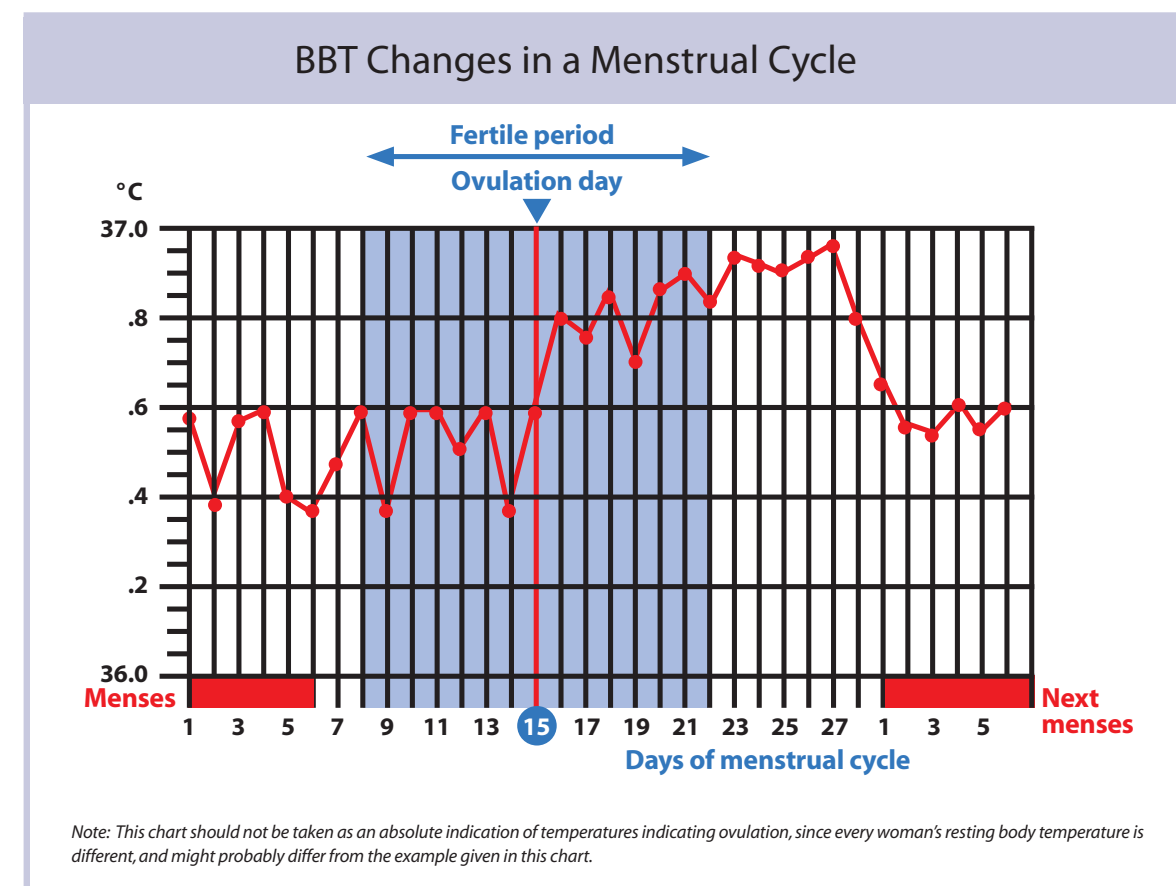
Many women are now delaying marriage or having children. But their biological clocks continue to tick

away. As women get older, the number of eggs in their ovaries decreases, and the quality of the eggs also deteriorates. When they finally decide that they want to start a family, they may find it hard or unable to conceive.

Causes & Risk Factors

According to the Department of Reproductive Medicine at KK Women's and Children's Hospital, apart from age, other common causes of infertility include (see the relevant sections in this chapter):

- **Ovulation disorder** such as polycystic ovarian disease
- **Damaged or blocked fallopian tubes**
- **Endometriosis**
- **Fibroids**
- **Male factor** usually due to low sperm count and/or quality in the male partner
- **Sexually transmitted infections (STIs)**



Other lifestyle factors include smoking, excessive alcohol consumption, excessive exercise and weight loss, as well as obesity.

Treating Infertility

Treatment for infertility depends on the underlying cause(s) of the problem, how long you've been infertile, you and your partner's age as well as personal preferences, such as how much you're willing to spend on treatment.

According to the Department of Obstetrics & Gynaecology, Singapore General Hospital, couples are usually advised to seek treatment for infertility after unsuccessfully trying to conceive for one year. This is because studies show that 85% of couples usually conceive after a year of having unprotected sex. However, if there is a problem from the start (e.g. very irregular menses, difficulty in sexual intercourse, erectile dysfunction, etc.), the couple should consider seeking professional help earlier.

Although specialised fertility treatment programmes may offer the highest success rates, in some couples, simple measures such as oral medication to induce ovulation, and reproductive surgeries such as the removal of endometriosis and polyps will help many to conceive naturally.

GETTING READY FOR PREGNANCY

So you feel that it's time to embark on the next stage – and some say the most important stage – of your life: starting a family. Even at this early stage, you can give your baby a head start. Read books on pregnancy, plan ahead and prepare yourself not just psychologically to become a parent, but also physically – by priming your body for pregnancy. Making sure that you are in good health will increase your chances of conceiving and help provide the right conditions for nurturing the developing baby.

See Your Doctor

First of all, make an appointment to see your doctor. If age is a concern (if you're over 35), ask your doctor to go through all the attendant risks and potential complications for both mother and baby associated with having a baby at your age. Discuss your diet and lifestyle – for example, if you're a vegetarian, ask him/her how this will affect your baby, and the different dietary and/or lifestyle adjustments that should be made to accommodate this factor.

Mention all the different medications, vitamins and supplements that you're currently taking, and check with your doctor that they are safe for pregnant women or women who are planning to get pregnant. If not, your doctor will be able to prescribe an alternative that is safer. Let him/her know about your medical history as well as that of your family, and that of your partner. Take the opportunity to raise any other concerns that you may have.

In general, the issues that should be addressed during pregnancy planning include:

- Nutrition
- Vitamins
- Body weight
- Exercise
- Avoidance of certain medication and alcohol
- Immunisations
- Genetic counselling

Adopt a Healthy Lifestyle

Start on a healthy lifestyle before pregnancy. Some ways you can prepare for conception include:

- **Cut down on or eliminate smoking, alcohol, caffeine**. Any drug abuse will also predispose you towards miscarriage.
- **Exercise regularly**
- **Eat a balanced diet**
- **Maintain a healthy weight.** If you're overweight or underweight, you should try

before IVF

Specialised fertility treatment programmes may offer the highest success rates for couples in need of assistance.

In intransigent cases, or in cases where no known cause is found (idiopathic subfertility), further steps that can be taken prior to considering in-vitro fertilisation (IVF) include:

1. **Fertility pills.** Oral medications such as Clomid aim to help conception by inducing the release of an egg or two. It acts by tricking the brain into thinking that oestrogen levels are low, and in response, FSH (follicle stimulating hormone) is increased to encourage the development of egg-containing follicles in the ovary.
This method is particularly useful for those who have problems with ovulation, typically characterised by irregular periods, and also those with idiopathic subfertility. It is safe and well-tolerated, and carries a small risk of multiple pregnancy.
2. **Ovulation monitoring.** The time of ovulation can be predicted by a series of ultrasound scans, occasionally aided by a urinary LH (lutenising hormone) kit. This helps to ascertain whether the woman is responding

to the fertility pills (e.g. Clomid) or is ovulating naturally, and helps to time intercourse for more effective conception.

3. **Intrauterine insemination (IUI).** A process where the semen is processed and injected into the cavity of the womb, which is often combined with ovulation monitoring to assist the sperm to be closer to the fallopian tube at the right time. This method is appropriate for couples with low sperm count issues, or who have problems with intercourse.
4. **Parahormonal induction of ovulation (PIO).** A series of FSH hormonal injections are administered to induce the development of egg-containing follicles in the ovary. The development of the follicle is monitored by scans. Once 1–3 follicles reach about 18 mm in diameter, another HCG injection is given to trigger the release of the egg. This is followed by IUI. The aim is to induce up to 3 follicles, since a higher number more may entail the risk of high-order multiple pregnancy. This method is suitable for those with ovulatory problems who do not respond to fertility pills, as well as for those with idiopathic subfertility.

to bring your weight to a healthy level. Being overweight may make it difficult for you to conceive, and may cause you to develop high blood pressure and gestational diabetes (see Chapter 5) during pregnancy, which can be dangerous.

Likewise, being grossly underweight may lead to problems with conception, as your body

is lacking the nutrients to either make a healthy baby or sustain a healthy baby when you're pregnant. It also puts you at risk of premature birth.

- **Start taking a daily prenatal supplement.** Pick one that contains 400–800 mg of folic acid to prepare your body for pregnancy. This can help prevent neural tube defects, which affects the baby's brain and spine. Studies

the art of making babies



Assisted reproductive technology (ART) is a group of different methods used to help a couple conceive by artificial or partially artificial means. It works by removing eggs from a woman's body, which are then mixed with sperm to be fertilised into embryos. These embryos are then put back in the womb for pregnancy.

The IVF Centre at KK Women's and Children's Hospital (KK IVF Centre) offers a comprehensive range of diagnostic and treatment procedures for infertility. The pregnancy rate is about 40%, which is comparable with the best in the world. These procedures include:

IN VITRO FERTILISATION (IVF)

This involves combining the eggs and sperms together outside the body, leading to fertilisation in the laboratory. After fertilisation, the embryos or fertilised eggs are allowed to grow for a short period of time before being implanted into the uterine lining. A successful pregnancy can be confirmed about two weeks later.

Initially used more in cases where the fallopian tubes are blocked or damaged, IVF is now used to treat many causes of infertility, such as endometriosis and male factor, or when a couple's infertility cannot be unexplained.

The basic steps in an IVF treatment cycle are:

- **Ovarian stimulation:** Medication or "fertility drugs" are used to stimulate multiple eggs to grow in the ovaries rather than the single egg that normally develops each month.
- **Egg retrieval**
- **Fertilisation and embryo culture**
- **Embryo transfer**



Injecting a healthy sperm into an egg in ICSI

Some advances in IVF treatments at KK IVF Centre include:

- **Laser assisted hatching** for repeated IVF failure and thick zona (the shell of the egg).
- **Blastocyst culture**, which extends the cultivation of embryos by three more days in the lab, and choosing the more advanced embryos to increase the chances of implantation.
- **Ultrasound-guided embryo transfer**, which uses ultrasound technology to place the embryos into the womb more precisely.
- **Pre-implantation genetic diagnosis**, which involves the screening of embryos for pre-existing genetic conditions, prior to implantation.

INTRACYTOPLASMIC SPERM INJECTION (ICSI)

This method involves directly injecting a healthy looking sperm into the cytoplasm of an egg through its shell. This is used when the sperm may be unable to fertilise the egg even in close proximity using the conventional IVF method, which is usually due to severe sperm factor.

Complications

Like all medical treatments, fertility programmes such as IVF and ICSI carry some risks.



Frozen human embryos in IVF treatment

According to the American Society for Reproductive Medicine, these include:

- **Ovarian hyperstimulation**, where the ovaries become swollen and painful.
- **Multiple pregnancy.** Many fertility treatments increase the chance of pregnancy by increasing the number of eggs produced by a woman or by replacing more than one embryo into the womb, hence resulting in multiple pregnancy and multiple births (twins or triplets). Multiple births carry risks to the health of both the mother and the unborn babies. The risk of premature delivery in multiple pregnancies is high, and babies may be born too early to survive. Premature babies require prolong and intensive care and may run the risk of lifelong handicaps due to preterm delivery.
- **Higher risk of ectopic pregnancy**, especially if the woman has existing problems that affect her fallopian tubes.
- **Miscarriage**
- **Possible higher risk of birth defects**
- **Physical, financial and emotional stress** associated with costly treatments with a high incidence of failure at any point of the treatment.

have shown that if you start taking folic acid at least four weeks prior to conception, the risk of birth defects of the spinal cord and skull can be reduced by more than 70%. This should be taken one month before conception and continued through the 12th week of pregnancy.

Signs & Symptoms

The primary sign of pregnancy in the first trimester of pregnancy is missing one or more consecutive menstrual periods. Women who experience menstrual irregularities should see their healthcare provider to find out whether they are pregnant or whether there is another health problem.

Although these vary across woman to woman, other signs and symptoms of pregnancy include:

- Nausea or vomiting, "morning sickness"
- Swollen, tender breasts or sore nipples
- Darkened areola
- Bloating
- Fatigue
- Headaches
- Food cravings or aversions
- Mood swings
- Frequent urination, especially in the night
- Urine leakage when coughing, sneezing or laughing
- Increased body temperature
- Enlargement of the abdomen

A pregnancy test is the best way to determine if you're pregnant. Home pregnancy test kits are available over-the-counter and are considered highly accurate. Your doctor will also be able to conduct a pregnancy test.

Credits: The following health institutions were consulted in this chapter: Department of Urogynaecology; Department of Reproductive Medicine; Women Wellness Centre; Nursing – KK Women's and Children's Hospital;; Department of Obstetrics and Gynaecology, Singapore General Hospital; Obstetrics & Gynaecology Department, Bao Zhong Tang TCM Centre, Singapore.