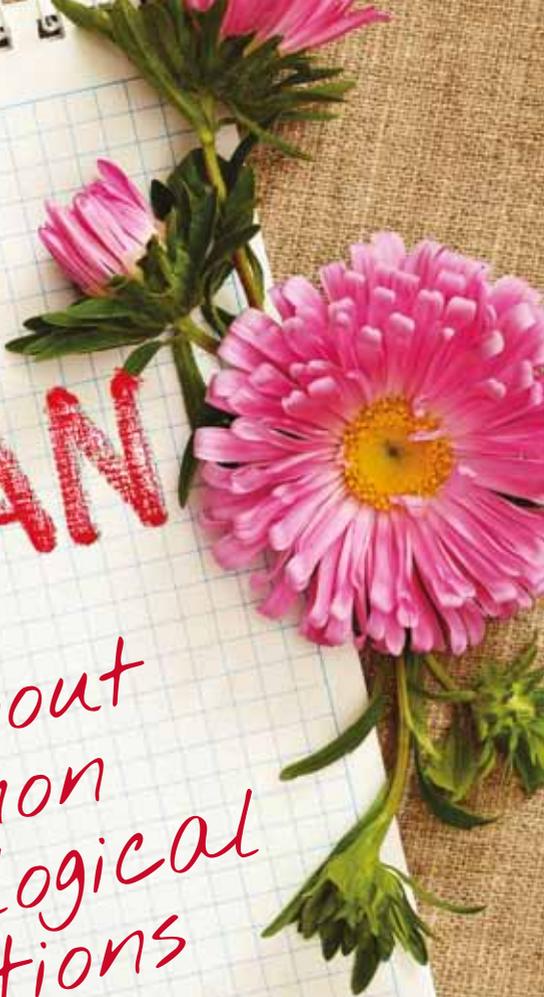


# ALL WOMAN

All about  
common  
gynaecological  
conditions



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All about Digestive and Liver Diseases

Published by the Marketing Communications and Partnership Development Dept, SingHealth.

# Foreword

A woman may go through various stages of body changes that can be challenging; from puberty to pregnancy to menopause. Many face complex health and lifestyle issues. In this edition of the SingHealth Healthy Living Series, we have introduced some common Obstetrics and Gynaecological conditions and symptoms.

Written simply, the booklet aims to impart general knowledge and explanation of these conditions in an accurate and relevant manner. We hope that this companion guide, contributed by our Obstetrics and Gynaecology (O&G) specialists will be beneficial for our readers and their loved ones.

At SingHealth, O&G Services are offered at both tertiary hospitals in KK Women's and Children's Hospital (KKH) and Singapore General Hospital (SGH). Our medical teams take the lead and are committed to delivering the highest standard of care for our patients.

**Assoc Prof Bernard Chern**  
**Chairman, SingHealth OBGYN**  
**Academic Clinical Program**  
**Chairman, Division of Obstetrics & Gynaecology**  
**KK Women's and Children's Hospital**

It gives me great pleasure to write this foreword for the Patient Information Booklet entitled *All Woman – All About Common Gynaecological Conditions*, which is part of the SingHealth Healthy Living Series. The contributors have included concise information about common gynaecological problems seen in our clinics. The conditions are presented in short, readable chapters with clearly articulated learning points on diagnosis and management.

One distinctive feature of the book is the use of simple language to describe these conditions and define them in a way that is relevant and easily understood by the patient.

I share in the enthusiasm that the authors have shown in writing this book, and hope that readers will find it a useful reference when faced with similar symptoms.

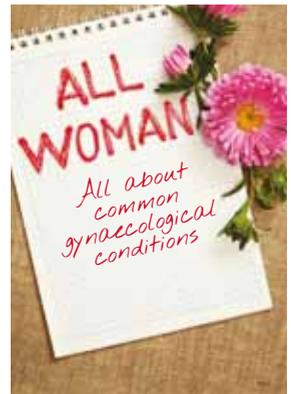
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**Singapore General Hospital**

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**Disclaimer:** All information provided within this publication is intended for general information and is provided on the understanding that no surgical and medical advice or recommendation is being rendered. Please do not disregard the professional advice of your physician.

# Menorrhagia

**In a normal menstrual cycle, the average woman loses a total of 30-40 ml of blood over three to seven days. Heavy or prolonged menstrual bleeding is known as menorrhagia.**

Research criteria defines this narrowly as a monthly menstrual blood loss in excess of 80 ml. A more practical definition may be that of menstrual loss that is greater than the woman feels she can reasonably manage. The National Institute for Health and Clinical Excellence (NICE) in the UK defines heavy menstrual loss as excessive blood loss that interferes with a woman's physical, social, emotional and/or quality of life.

Menorrhagia is a common problem in clinical practice that can have adverse effects on the quality of life for many women.

## Causes

Causes include :

- 1. Dysfunctional uterine bleeding** (excessive bleeding with no identifiable cause): 20-40 percent.
- 2. Anovulatory cycles** (more common

at extremes of reproductive age): 20 percent.

- This means that the ovaries do not release the egg at each cycle. This is due to hormonal imbalance.
- In adolescents, the most common cause is an immature hypothalamus-pituitary-ovarian axis. (i.e. the chemical signalling process between the brain and the ovaries).
- In perimenopausal women, it can be due to the depletion of ovarian function.

- 3. Organic causes.** Fibroids, endometrial polyps, adenomyosis, endometritis, pelvic inflammatory disease.
- 4. Endometrial hyperplasia and carcinoma.** This is a consideration especially in patients above 40 years old or with risk factors such as polycystic ovarian syndrome, obesity, nulliparity, early menarche, diabetes mellitus, excessive oestrogen (female hormones) either produced by the body or supplemented externally.
- 5. Systemic disease.** Including hypothyroidism, liver or kidney failure and bleeding disorders.

## Signs and symptoms

You may be experiencing menorrhagia if you have the following:

- Soaking through more than four to five pads/tampons per day
- Bleeding associated with large clots or overflow (staining of underwear or clothes)
- Needing to use double sanitary protection to control the flow
- Having to wake up at night to change sanitary protection
- Bleeding that lasts longer than a week
- Restriction of activities due to heavy flow
- Symptoms of anaemia (low blood count) such as being easily tired out, experiencing giddiness or shortness of breath with exertion

## Diagnosis

During consultation, your doctor will ask questions and perform an examination to try to determine the cause of the heavy menstrual bleeding.

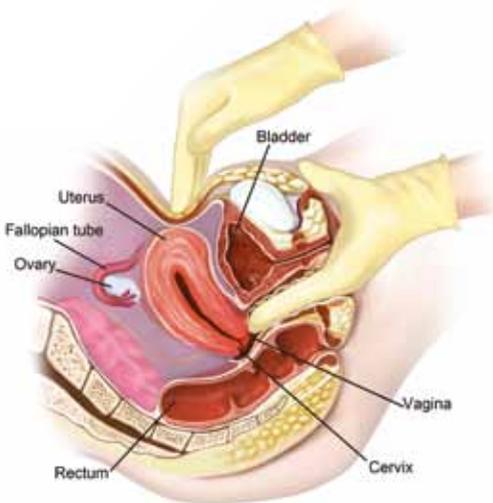
Important information that you may provide to the doctor during the consultation include:

1. Other associated menstrual problems – pre-menstrual syndrome, inter-menstrual bleeding, post-coital bleeding, dyspareunia and pelvic pain
2. Fertility wishes
3. Whether you have symptoms of anaemia
4. Effect on your quality of life, including any time off work
5. Past medical problems, including clotting disorders, thyroid status and gynaecological history
6. Easy bruisability or bleeding gums
7. Your recent PAP smear, gynaecology history
8. Any family history of cancer

Clinical examination will be undertaken to assess for any anaemia and also to rule out potential organic causes of menorrhagia. This usually includes a pelvic examination.

Tests that may be carried out include:

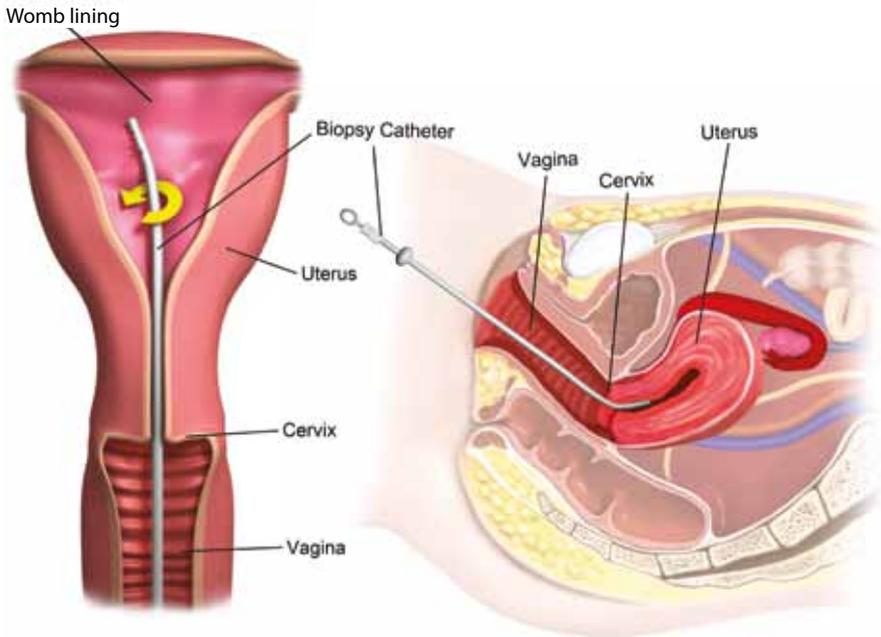
- Urine pregnancy test to rule out pregnancy
- It is a good opportunity to have a PAP smear undertaken if not done recently
- Ultrasound (ideally trans-vaginal) is the first-line diagnostic tool for identifying abnormalities such as fibroids and polyps. The thickness of the lining of the womb can be seen on ultrasound.



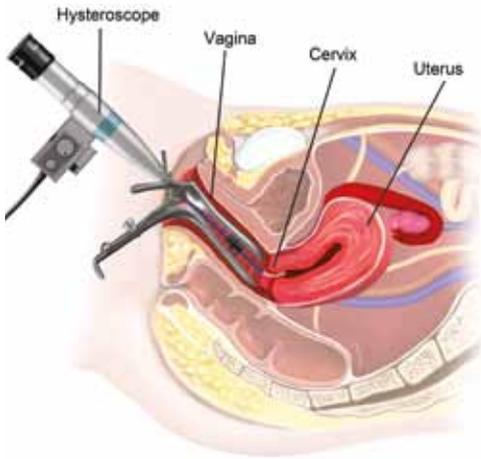
A pelvic exam.

- Endometrial sampling may be offered to test the cells in the lining of the womb, especially if there is a risk of cancer (determined by the above). This may be done in the clinic, or as a day surgery procedure called dilatation and curettage

combined with the use of a small telescope to look at the inside of the womb, known as hysteroscopy. This procedure will also need to be considered in women who have not responded to medical treatment for menorrhagia.



Endometrial sampling to test cells in the lining of the womb.



A hysteroscopy to examine the inside of the womb.

A full blood picture will give an estimation of the degree of anaemia (low blood count). Other blood tests such as thyroid function tests and bleeding disorder testing may be performed if your doctor suspects a disorder.

## **Treatment**

The important conditions to rule out first include pregnancy, endometrial hyperplasia (abnormal thickening of the lining of the womb) and endometrial carcinoma.

If there are organic causes of menorrhagia, such as fibroids or adenomyosis, treatment options can be offered based on your wishes and fertility concerns.

If there is suspected chronic endometritis (risk factors include recent childbirth or intrauterine procedure), this can often be treated with a course of antibiotics.

If you are found to be anaemic, iron supplementation is usually recommended.

The general considerations guiding the choice of initial treatment are:

- Reason and severity of bleeding
- Associated symptoms (e.g. pelvic pain, infertility)
- Fertility – Contraceptive needs or plans for future pregnancy
- Contraindications to hormonal or other medications
- Medical comorbidities
- Restriction of activities due to heavy flow
- Patient preferences regarding medical versus surgical and short-term versus long-term therapies

In the absence of any structural or histological abnormalities, or fibroids more than 3 cm causing distortion of uterine cavity, the recommendations for treatment are:

**First line:**

**1. Levonorgestrel intrauterine system (LNG-IUD) - Mirena**



- This is a hormone-releasing intrauterine device which can last for five years. Studies have shown this to be more effective than other medical treatments.
- This option reduces blood loss by up to 94 percent. Some women experience an increase in irregular or heavy bleeding during the first three months after placement of the LNG-IUD.

After three months, the most common bleeding pattern in previously menorrhagic women is spotting, and after six months, the majority of patients have amenorrhoea (absence of menstruation) or oligomenorrhoea (infrequent menstruation).

- Other benefits include reduction in dysmenorrhoea (painful menses) in patients with endometriosis or adenomyosis, reduction in endometrial cancer risk, as well as birth control.

**Second line:**

**1. Tranexamic acid**

- This medication works by stabilising a protein that helps blood to clot. It can reduce flow by up to 50 percent and is taken three or four times a day, for a maximum of three to four days during the period.
- This medication is non-hormonal in nature and will not affect fertility.

**2. Non-steroidal anti-inflammatory drugs (NSAIDs)**

- Medications in this class of drug include ponstan (mefenamic acid),

naproxen (synflex), ibuprofen.

- NSAIDs work by reducing your body's production of prostaglandin from the womb, which is linked to heavy periods. NSAIDs are also painkillers. They do not affect your fertility and are taken during your period.
- The reduction in blood loss is by 33-55 percent.
- Side effects include nausea, vomiting and diarrhoea.

### **3. Combined oral contraceptive pill (COCP)**

- These contain two hormones – oestrogen and progesterone.
- There is a reduction of menstrual blood loss by around 40 percent.
- Other benefits include birth control, regulation of cycle, improvement in pre-menstrual symptoms, reduction in painful menses and protection of the ovaries and endometrium (womb lining) against cancer.

#### **Third line:**

### **1. Norethisterone**

- This is a type of man-made progesterone (one of the female sex hormones).
- This is taken, from day 5 to 26 of

the menstrual cycle.

- It is not an effective form of birth control and may have side effects such as weight gain, breast tenderness and acne.
- It is usually used for short-term treatment of menorrhagia.

### **2. Progesterone injection**

- A type of progesterone called medroxyprogesterone acetate is also available as an injection and is sometimes used to treat menorrhagia.
- This is useful for contraception and is usually given three-monthly. This treatment is usually limited to two years due to risk of bone loss with prolonged use.
- Side effects include weight gain, irregular bleeding, occasional delayed return to fertility after stopping the medication.

### **3. GnRH analogue**

- This is hormone medication given to mimic menopause (it lowers the female hormones in the body).
- It is not a routine treatment but may be used to shrink fibroids before operation and control bleeding to allow anaemia to recover before surgery.

- This may be considered also if you are close to menopause and other treatments are not working or contraindicated.

---

## **Surgical options**

The choice of treatment will depend on both the uterine size and the patient's desire to retain her uterus.

### **1. Endometrial ablation**

- This option can be considered if the uterus size is not too large or distorted by fibroids. You will also need to use a reliable form of contraception after the treatment as pregnancy is contraindicated due to the high risk of problems.
- This involves removing the full thickness of the lining of the womb.

### **2. Uterine artery embolisation**

- This involves injecting small plastic beads to block the arteries supplying the womb.
- This is usually offered to women who have heavy menses due to large fibroids, as blocking the blood supply will cause the fibroids to shrink with time.

### **3. Hysterectomy (removal of the womb)**

- This option can be considered when other options have been exhausted and the patient chooses not to retain her fertility.
  - \* If menorrhagia is due to fibroids, surgical treatment may include myomectomy (surgery to remove fibroids), rather than hysterectomy.
-

# Amenorrhoea

**Amenorrhoea is defined as the absence of menses, when a woman does not see her menstrual period. This can be normal in the case of pre-pubertal girls, pregnancy or following menopause.**

However, in other women it is a sign of a gynaecological problem, although the menstrual cycle can also be affected by other diseases.

It is divided into two groups:

**1. Primary amenorrhoea** – this is when a female has never had menses. This is considered abnormal if menses has not started by age 16 or if there has been no development of breasts or pubic hair by age 14. It is a problem affecting about 3 percent of younger women.



Secondary amenorrhoea can affect women of any age.

**2. Secondary amenorrhoea** – this is when a woman who had menses previously, then experiences no menses for six months or more. This can affect women of any age. These women have normal breast and pubic hair development.

The two types have different causes and treatments and these will be discussed in the next section. There are many potential causes but the commonest are highlighted in bold.

## Causes

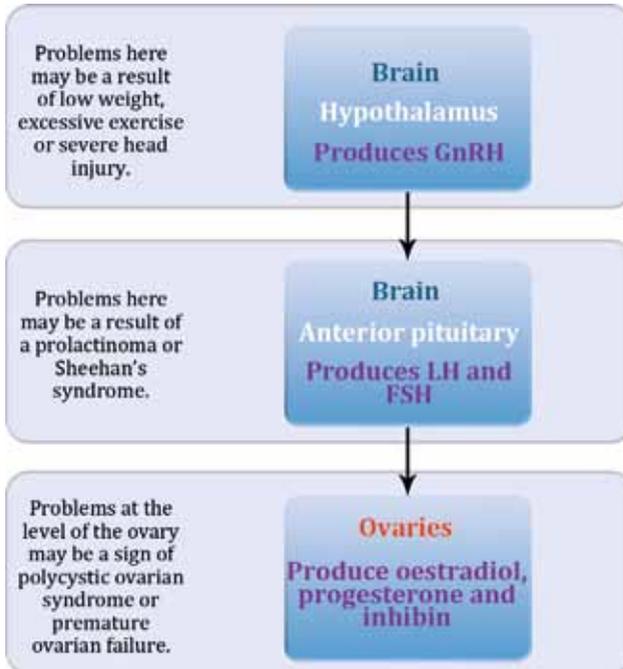
### Secondary amenorrhoea

Secondary amenorrhoea is commoner so it will be discussed first and in more detail.

There are two areas of the brain which influence the menstrual cycle – the hypothalamus and the pituitary. The hypothalamus produces gonadotrophin releasing hormone (GnRH) which

stimulates the anterior pituitary to produce luteinising hormone (LH) and follicle stimulating hormone (FSH). The anterior pituitary hormones then affect the ovaries causing release of oestradiol, progesterone and inhibin. These hormones have an intricate link and the timings and amounts affect the menstrual cycle.

The diagram below illustrates the influence of the brain and ovaries on the production of hormones.



Influence of the brain and ovaries on the production of hormones.

### Hypothalamic causes

- **The commonest reason for problems at this level is low weight or a low body mass index.**

If a woman's weight is below 10-15 percent of her expected normal range it may be that the levels of GnRH are reduced and this can cause amenorrhoea.

- Excessive exercise may result in a low body mass index/weight, but there may be other factors.
- General health problems such as tuberculosis or sarcoidosis, which are rare, but can also affect menses at this level.
- Severe head injury or previous radiotherapy to the brain can cause decreased GnRH leading to amenorrhoea.
- Although rare, brain tumours, both benign and malignant, can cause amenorrhoea.

### Pituitary causes

- Sometimes a tumour, usually benign, of the pituitary can cause high levels of prolactin which decrease GnRH production from the hypothalamus causing amenorrhoea.

- If a woman has experienced major haemorrhage, requiring intensive treatment and blood transfusions, usually at childbirth when the pituitary is larger and more sensitive, this can result in damage to the pituitary reducing the release of FSH and LH and causing amenorrhoea.

### Ovarian causes

- **Polycystic ovarian syndrome (PCOS) is one of the most common causes of amenorrhoea and is found in about 8 percent of the female population.**
- Premature ovarian failure is defined as the stopping of menses prior to age 40, with high levels of FSH and LH. The cause in most women is not found but it can be a result of treatment with medication such as chemotherapy; radiotherapy; infection; autoimmune disease; or very rarely a chromosomal problem.
- Rarely, benign cysts of the ovaries, dermoid cysts can cause amenorrhoea.

## Other causes

- Cervical stenosis, a blockage that occurs in the cervical canal, when the menses cannot flow out of the uterine cavity, may result in amenorrhoea. This can be caused by surgery.
- Ashermann's syndrome which is caused by surgery or infection that results in scar tissue within the uterine cavity. This causes the endometrium, lining of the uterus, to not develop normally causing amenorrhoea.
- Drugs may influence the menses and these may be taken as part of the treatment for heavy menses e.g. progesterones or hormone replacement therapy or the combined pill if taken continuously. Other drugs such as medications for nausea can have side effects of stopping the normal menstrual cycle, but this is rare.
- Any chronic health problems may influence the menstrual cycle and cause amenorrhoea, e.g. diabetes, renal failure, thyroid disease, liver disease.
- Very rarely, tumours of the adrenal glands, a gland near the kidney can cause amenorrhoea.

## Primary amenorrhoea

Again, the causes can be split into the various levels.

Commonly it can be constitutional, often following a family pattern, which is the commonest cause. However, it can also be due to the effect of other chronic illnesses such as diabetes.

Anorexia nervosa or excessive exercise can be a cause in teenagers. Problems with the development of the pituitary or tumours of the pituitary or hydrocephalus are much rarer causes.

Problems with the normal functioning of the ovaries or the absence of ovaries can also result in no menses. This can be due to abnormal development, premature ovarian failure, genetic problems, autoimmune disease, infections or following chemotherapy/radiotherapy.

Genetic problems can be a rare cause of amenorrhoea e.g. Turner syndrome which is when the child only has one copy of the X chromosome.

Anatomical causes are more common in primary amenorrhoea:

- Imperforate hymen, which is a hymen with no opening which also usually presents with pain.
- Developmental abnormalities of the vagina, cervix and uterus such as a vaginal septum, or even absent uterus.

### **Prevention**

The commonest reasons are weight-related. If the cause is low weight or excessive exercise then lifestyle advice and a healthy weight will prevent further problems and the menses should return.

If the woman is affected by polycystic ovarian syndrome this is commonly exacerbated with weight gain. Again, lifestyle and diet to reduce weight to normal in these women is likely to result in more regular cycles.

### **History and examination**

Your doctor should take a detailed history from you and examine you. This should include a breast examination and a check for other signs of normal sexual development e.g. axillary and pubic hair growth, especially in women who are younger and never had a menses.



The most common causes of amenorrhoea are weight-related.

The examination may include a check of your visual fields by the doctor. It is usual to examine both the external genitalia and a vaginal examination both with a speculum and a bimanual examination.

Your height and weight should be taken and your body mass index calculated.

## Investigations

A pregnancy test should be offered as this is the commonest cause of secondary amenorrhoea.

A range of hormone tests may be ordered depending on the symptoms and signs:

- Follicle Stimulating Hormone (FSH)
- Luteinising Hormone (LH)
- Oestradiol
- Prolactin
- Testosterone
- Sex hormone binding globulin
- Thyroid function

It is usual to have an ultrasound of the pelvis to assess the uterus and ovaries. In women who have been sexually active or have used tampons during menses, this can be carried out using a

small vaginal probe, which should not be painful.

Other investigations which rarely may be required are:

- CT or MRI to exclude rare tumours of the hypothalamus, pituitary, or adrenal glands.
- Blood tests for chromosomes.
- A hysteroscopy, an investigation when a small camera is passed into the uterus through the vagina and cervix.

## Treatment

The treatment is dependent on the cause.

**For women who are underweight** resulting in amenorrhoea, lifestyle and dietary advice is the mainstay. However, if their oestrogen levels are very low they may benefit from hormone therapy to prevent osteoporosis.

**For women with polycystic ovarian syndrome** there is no cure as the exact cause for it is still not completely known. However, weight loss in women with high BMI can help the return of more regular menses.

**Women not wishing to conceive**

who are not seeing their menses are usually advised to start hormonal treatment. This is especially important if the menses come less frequently than three-monthly, as this in the longer-term increases the chance of endometrial abnormalities and over the years can increase the risk of endometrial cancer. Therefore, the combined pill or progesterones every three months can be used to provoke a bleed to shed the endometrium. Metformin is a non-hormonal daily treatment which can sometimes be considered. It is important to stress that there are many treatments to help if you are trying to conceive.

**Problems with excess facial or body hair**

are experienced by many women with PCOS. Creams which can be used to slow the growth of the hair, along with laser treatment can help with this. A specific type of the combined pill can also be helpful for symptoms of excess hair growth or acne.

**High levels of prolactin**

normally just requires treatment with medication, rarely is surgery required. A referral to a Specialist in this area, an Endocrinologist, is usual.

**Premature ovarian failure** is not normally reversible, and this can cause women to consider oocyte donation with fertility treatment if pregnancy is desired. This can be a very difficult diagnosis and extra psychological support may be needed.

**Hormone replacement therapy** is normally advised either in the form of the combined oral contraceptive pill or hormone replacement therapy to prevent osteoporosis in the long term, which has significant morbidity and mortality compared to the risks of treatment.

**Surgery** may be required for tumours in the hypothalamus, ovary or adrenal gland, as well as for intrauterine adhesions or problems with cervical stenosis.

If the cause of the amenorrhoea is due to other disease then optimising the control of these medical problems is the key to treatment.

# Dysmenorrhoea and Endometriosis

**Dysmenorrhoea is defined as painful menses and is reported by up to 50-90% of women.**

It is described as **primary dysmenorrhoea** if no underlying cause of the pain is found and the reproductive organs and pelvis are seemingly normal. This appears to be more common in younger women and tends to resolve with increasing age.

Other risk factors include BMI <20 kg/m<sup>2</sup>, smoking, menarche before age 12, longer cycles and longer duration of bleeding, irregular or heavy flow, and a history of sexual assault.

**Secondary dysmenorrhoea** is menses pain where an underlying condition causing the pain is found by your doctor. For example this may be endometriosis, adenomyosis, fibroids or pelvic infection. The most common cause of secondary dysmenorrhoea is endometriosis.

## Endometriosis

Endometriosis is a common condition affecting around 8 percent of the female population.



Endometriosis is common; about 8% of women are affected.

It is caused by the lining of the womb (endometrium) appearing in other places in the body. Most commonly, endometriosis occurs inside the pelvic area and attaches to the ovaries, the ligaments behind the womb, the tissue layer lining the pelvis, the bladder and ureters or the intestine.

Endometriosis can occur in minimal amounts (Stage 1) through to severe amounts (Stage 4). The cause of endometriosis is still unknown. Adenomyosis is endometriosis in the muscle layer of the womb itself.

## Symptoms

Endometriosis may cause pelvic pain or infertility although many women with endometriosis have neither problem. Having more endometriosis does not mean you will have more pain, as women with only a minimal amount can have more pain than women with severe disease.

Pelvic pain in endometriosis is mostly associated with menses and occurs on a monthly basis. However, other significant symptoms may be:

- Pain felt deep inside the vagina during or after sexual intercourse
- Pain felt during passing of motion

These also tend to be worse during menses. Pain can also occur throughout the month and may then be described as chronic pelvic pain.

Although it is normal to have some discomfort during menses, it is not

normal to have pain that is not relieved by simple painkillers or if it forces you to take time off work or miss social events. These may suggest that you have endometriosis and should seek medical help.

## Rarer forms of endometriosis

In more rare cases, you may have bleeding from the back passage or bleeding when you pass urine during menses, suggesting that endometriosis is affecting the rectum or bladder.

Cyclical pain during menses in an old operation scar (e.g. caesarean section scar) may suggest that there is endometriosis in it. Coughing up blood during your menses may indicate lung endometriosis.

## Is endometriosis linked with fertility problems?

When we look at women who are struggling to become pregnant, we find that a greater number of them have endometriosis than we would expect to find in the general population showing a link between endometriosis and infertility but this is poorly understood.

## Diagnosis

The average age of onset of pain symptoms in endometriosis is 20 years old but the average age of diagnosis is 28. This is because many women ignore the pain symptoms because they think it must be normal and do not wish to appear as if they are complaining or doctors dismiss their complaints too easily.



Don't ignore the pain, it is not normal.

Your gynaecologist may suspect you have endometriosis after asking about your symptoms. Normally they will arrange for you to have an ultrasound scan which can diagnose endometriotic cysts in ovaries. An expert endometriosis scanner can detect severe endometriosis in other areas also.

However, minimal to mild endometriosis cannot be detected by any test or scan. The only way to diagnose it is to undergo a diagnostic laparoscopy (keyhole surgery) under general anaesthetic and to see it directly. A gynaecologist who specialises in endometriosis would then aim to remove all visible endometriosis at the same time.

If your doctor suspects or finds you to have more severe disease affecting the bowels, bladder or ureters, you may need further specialist tests to assess the problem before it is removed.

## Treatment and impact on fertility

It is crucial that your endometriosis treatment is tailored to your own

specific circumstances and that you see a specialist in endometriosis who can advise you on this. Your treatment will depend upon your age, desire for a diagnosis, fertility requirements and pain symptoms.

Do not just accept the first treatment offered without understanding why it is being offered in your situation. A consultation for complex endometriosis will take at least 45 minutes.



It is important to understand your treatment plan.

## **Pain**

There is no absolute cure for endometriosis and it tends to be an issue that remains with you for most of your fertile years.

Both medical and surgical treatments give a measure of relief from pain depending on the type of

endometriosis you have. The amount of pain relief can vary greatly depending on many factors. Pain can recur after stopping medical treatments or at a later date after surgery.

If you are not keen to have a diagnostic laparoscopy (keyhole surgery) to confirm that you have endometriosis, then it may be reasonable to try medical treatments first and then consider a diagnostic laparoscopy later if the medical treatments do not work.

## **Medical treatments**

All of the hormonal treatments have been shown to be equally effective as each other at relieving pain but none of them improve fertility. The choice of drug treatment is decided by your age, requirement for birth control and the potential side effects of the drugs.

- 1) Simple painkillers may be used. However, most women have already tried these before they see a gynaecologist.
- 2) Hormonal drugs can be used to mimic the hormone levels found in pregnancy as we know that endometriosis pain tends to

improve during pregnancy. Your doctor may prescribe oral oestrogen and progesterone combined, progesterone only medication, or a progesterone impregnated coil that fits inside the womb.

- 3) You can also take hormone drugs to temporarily mimic menopause as we know that endometriosis tends to resolve once the menses have stopped. This is generally done by injections that temporarily switch off the ovaries during the treatment period. Your menses will return after the treatment is stopped without risk to your fertility. However, these drugs cannot be used long-term in most cases.

### **Surgical treatment**

Some women may decide to proceed directly to a diagnostic laparoscopy because they wish to be certain if they do have endometriosis. Knowing the cause of the problem helps them psychologically to deal with it.

Surgical treatment requires the help of a gynaecologist who specialises in endometriosis and minimally invasive surgery (keyhole surgery).

For minimal to moderate disease (Stage 1-3), the surgeon should be comfortable to diagnose the problem during laparoscopy and surgically remove it, preferably by excision, and at the same time, to get the best chance of pain relief. Many general gynaecologists are not fully trained in these techniques.

If your gynaecologist discovers severe disease then, to treat it at the same time, they should have discussed with you the pros and cons of surgical removal. In severe cases, endometriosis surgery is a high-risk complex operation that should only be attempted by a fully-trained expert in specialist centres.

Not everyone requires surgical removal of severe disease as it can compromise your fertility. Robotic keyhole surgery now potentially offers the most accurate and precise surgery for severe cases of endometriosis with the lowest risks of complications. About 80 percent of patients undergoing surgery say that their pain improves to varying extents.

Your gynaecologist should also be able to offer you access to other specialists as required, for example:

- Pain, intestinal or urinary system specialists
- Psychological and psycho-sexual support

### **Fertility**

If you are found to have endometriosis-associated infertility then the choice is whether to have surgery or assisted fertility treatments (IVF or IUI) or both.

With minimal to moderate endometriosis, there is evidence that surgically removing the endometriosis deposits and endometriotic ovarian cysts improves your chances of conceiving spontaneously reducing the need for assisted conception techniques.

There is some evidence that surgically removing severe endometriosis before infertility treatment improves your chances of success. However, there is a small risk of damaging your fertility with surgery in some cases and so assisted conception techniques may be recommended in the first instance so as not to risk affecting your fertility further from surgical complications.

Surgery may also be needed first if:

- 1) The pain is so severe that it is the major problem, rather than the fertility issue.
- 2) You have large endometriotic cysts on the ovaries that are interfering with the infertility specialist's ability to collect eggs for IVF.

Dysmenorrhoea and endometriosis can be physically and mentally debilitating, affecting every aspect of a woman's life.

Women with endometriosis tend to have more problems maintaining their careers and relationships as they may be fighting with chronic pain and fertility issues.

Seeing a gynaecologist who specialises in this area gives a good opportunity to keep the pain under control and achieve fertility aspirations.

# Fibroids

**Fibroids are growths arising from the muscle wall of the uterus. It is a round and firm structure amid the soft muscle layer. When cut open, the pale and dense cut surface gives us the impression that it is a growth of densely packed fibrous tissue. The growth attracts the common name of fibroid because of these characteristics.**

In medical term, fibroid is known as leiomyoma. It reflects the true nature that the growth is a benign (not cancerous) tumour developed from abnormal muscle cells of the uterus, not fibrous tissue.

## **How common are fibroids?**

Fibroids are the most common non-cancerous growths in women. They can develop in women of any age after the onset of menstruation. The incidence increases with age. By 40 years old, more than 50 percent of women would have one or more fibroids. It is not uncommon to see mother and daughters or sisters in the same family with fibroids.

## **What causes fibroids?**

Each fibroid develops from a single muscle cell in which certain genes have been damaged or altered. The genetic changes lead to a more rapid cell division than usual in response to stimulation of hormones and growth factors. The cell division is also uncontrollable which results in a large number of abnormal muscle cells and the formation of a visible growth.

It is quite common for muscle cells from different parts of the uterus to develop these genetic changes over a period of time. This results in the forming of many fibroids on the same uterus.

The cause of genetic changes is currently unknown. It is clear that there is no fibroid gene that can be passed from mother to daughters in a direct genetic inheritance manner. There is also no association of fibroids with dietary habits or history of childbearing.



There is no fibroid gene that can be passed in a direct genetic inheritance manner.

### **What happens to fibroids once developed?**

Although the muscle cells made up of fibroids are abnormal in their genes, they are responsive to oestrogen, the female sex hormone.

**During the years that a woman is menstruating,** oestrogen stimulation leads to the continual growth of fibroids. In general, a fibroid increases in size by 1 cm a year.

**During pregnancy,** fibroids are known to grow more rapidly than during the non-pregnant period.

**At menopause** as oestrogen secretion ceases, many fibroids shrink in size slowly in the post-menopausal years. However, fibroids will not disappear completely, even years after menopause.

**Some other growth factors** are known to influence the growth of fibroids. These growth factors are not changed by menopause. This explains why some fibroids fail to shrink or may even continue to grow despite menopause.

Fibroids can be classified according to their size (Table 1) or by their location in the uterus (Table 2):

Table 1: Classification of fibroids by size

<b>Size of fibroid:</b>	<b>Category</b>
<3 cm	Small
3-5 cm	Moderate
6-10 cm	Moderately large
>10 cm	Large

Table 2: Classification by location

<b>Location of fibroid:</b>	<b>Category</b>
Outer surface of uterus	Subserous fibroid
Within muscle wall	Intra-mural fibroid
Under lining of uterus	Submucous fibroid
A polyp growth in the cavity of uterus	Fibroid polyp

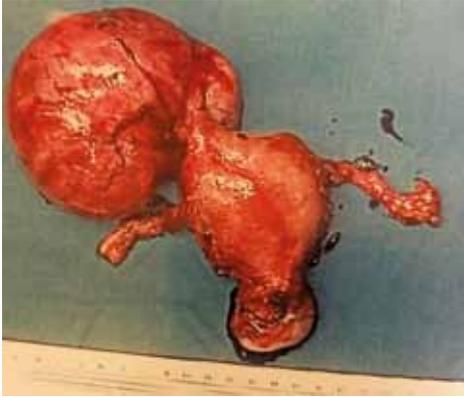
It is very common for fibroids of different sizes and locations to be present on the same uterus.

## How do I know if I have a fibroid?

Fibroids are typically silent in at least 60 percent of women. They are discovered on a routine examination of the pelvis or when an ultrasound scan of the pelvis is carried out for some other reasons. In the other 40 percent of women, fibroids may cause one or more of the following symptoms:

- Heavy menstrual flow
- Prolonged menstrual flow
- Symptoms and signs of anaemia from heavy menstrual flow
- Abdominal distension or pain
- Changes in urinary habits: frequent urination and sensation of not emptying the bladder completely; or difficulty in passing urine
- Constipation
- Backache
- Swollen leg from deep vein thrombosis

On examination of the pelvis, a doctor may suspect a fibroid if the uterus is found to be larger in size than normal or the contour of the uterus is irregular.



The large lump at the top is the fibroid. The organ below it is uterus, which is otherwise normal.

The diagnosis is typically based on the finding of a growth on ultrasound scan of the uterus. CT-scan or magnetic resonance imaging (MRI) scan of the abdomen and pelvis will also show the presence of uterine fibroids.

### **Does a fibroid affect my fertility or my pregnancy?**

A common condition, fibroids are found in many women who experience difficulty in becoming pregnant. There is, however, no evidence to show that fibroids cause infertility. If they do, it happens only in a very small proportion of women, for example, in a situation when a fibroid of moderate size located near the fallopian tube causes a blockade in the tube.

It is a common belief that fibroid can cause the pregnancy to miscarry. Research has not shown a conclusive evidence for this belief. Why miscarriage seems to happen commonly in women who have fibroids can be explained by the facts that both fibroids and miscarriage are commoner as a woman becomes older. In fact, the great majority of women with fibroids, including those with a large fibroid, continue the pregnancy with no abnormal outcomes.

A peculiar complication of fibroids during pregnancy is an uncommon change in the fibroid known as 'red degeneration'. This condition causes abdominal pain that may require treatment with pain killers. This condition, however, has no adverse outcome on the pregnancy in terms of miscarriage or premature birth of the baby.

## **How can my fibroid be treated?**

The majority of women have small or moderate size fibroids. In general, these women do not experience any problem from the fibroids and do not require treatment. In other women, the decision on initiation and choice of treatment of fibroids depends on individual circumstances. The treatment available includes the following:

### **Treatment of heavy menstrual flow**

Menstrual flow can be reduced with medication such as tranexamic acid, danazol, progesterone hormone or gonadotrophy releasing hormone analogues. This form of treatment is appropriate when the fibroid is small or moderate in size. It is also more appropriate among women who are close to menopause when treatment may be limited to a short period of time before menopause ensues. This treatment is not a cure of fibroids.

### **Hysteroscopic resection of fibroid**

Submucous fibroid or fibroid polyp can be effectively removed by resection through a hysteroscope. It is a

minimally invasive procedure through the vaginal and cervical approach. This technique is suitable for women of any age, including those considering pregnancy in the future.

### **Uterine artery embolisation**

Solitary fibroid of moderate or moderately large size can be treated by blocking the blood flow (embolisation) to the fibroid. This is an interventional radiology procedure involving inserting an arterial catheter to the uterine artery under fluoroscopic guidance. This technique is not a complete cure for fibroids.

Instead, after successful arterial embolisation, the size of the fibroid can shrink by almost 60 percent and the heavy menstrual flow can be reduced by almost 80 percent. The treatment is appropriate for women who want to avoid the risk of surgery. It is not appropriate for women whose fibroids need to be submitted for pathological tests.

### **Surgical removal of fibroids, also known as myomectomy**

In this operation, fibroids are removed and the uterus is repaired for resumption of its normal menstrual and childbearing functions. Fibroids of moderate to moderately large sizes can be effectively removed through laparoscopic surgery. Laparoscopy is proven to be efficient and is associated with less pain and shorter recovery time compared to conventional surgery. Robotic surgery is an alternative minimally invasive procedure for treating these types of fibroids.

On the other hand, traditional open surgery remains the most versatile approach to remove all fibroids, regardless of the size and their location on the uterus. Good surgical repair on the incisions on the uterus confers additional safety on the integrity of the wounds in ensuing pregnancies.

### **Hysterectomy or removal of the uterus**

For women who do not desire to conserve the fertility potential, removal of the uterus (hysterectomy) confers the most appropriate and complete treatment.

### **Can fibroids recur after treatment?**

Once the fibroids are removed, the uterus resumes its normal structure. There remains a potential risk that some muscle cells may develop genetic changes leading to development of new fibroids. There is a 10-30 percent chance that new fibroids will develop after the myomectomy operation. There is obviously no recurrence of fibroids if a hysterectomy is performed.

### **Would a fibroid turn malignant?**

Fibroids are by nature non-cancerous tumours. The malignant form of fibroid is known as leiomyosarcoma. It is a very rare tumour developed from abnormal muscle cells unrelated to fibroids. It can occur in the uterus with existing fibroids or without fibroids. Development of malignancy within an existing fibroid is extremely rare and is not a consideration for decision for surgery on fibroids.

# Ovarian Cysts

**Ovarian cysts are fluid-filled sacs that form within the ovary. They vary in size and content, and may be benign or malignant. Most cysts are asymptomatic and non-cancerous, and resolve spontaneously without any treatment.**

## Types of cysts

**Functional cysts** develop as part of a normal menstrual cycle. These include:

### a) Follicular cysts

New follicles develop during the start of each menstrual cycle. Each contains fluid that protects a developing egg, which is released at the time of ovulation. If the follicle fails to release the egg, it may continue to grow and form a follicular cyst.

### b) Corpus luteum cysts



Corpus luteum cysts.

If ovulation takes place, the follicle develops into a corpus luteum. This produces progesterone, which modifies the womb lining to prepare it for pregnancy. The corpus luteum typically dissolves if pregnancy does not take place, but may occasionally bleed or swell with fluid to form a corpus luteal cyst.

The majority of functional cysts resolve spontaneously over two to three menstrual cycles. However, some may continue to grow or even twist or rupture and cause acute symptoms.

**Polycystic ovaries** are ovaries containing multiple small follicles. This may be seen in conjunction with irregular menses, subfertility and symptoms of hormonal imbalance like oily skin, acne and increased hair growth.

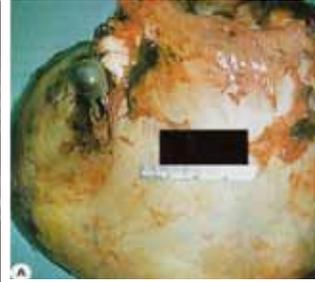
**Benign ovarian cysts** include:

**a) Endometriotic cysts**

Endometriosis occurs when cells from the womb lining develop outside the womb. Deposits of these cells on the ovary can result in the formation of endometriotic cysts. These cysts contain thick, dark brown material, and are frequently adherent to surrounding structures such as the uterus, opposite ovary or intestines, which may make surgery more challenging.

**b) Dermoid cysts**

Dermoid cysts develop from germ cells, which are cells that are able to develop into any type of body tissue. They may therefore contain various types of tissue including teeth, hair and fat, and are more commonly seen in younger women.



Endometriotic cysts.



Dermoid cysts.

### c) Cystadenomas

These arise from the outer surface of the ovary and may contain fluid or mucoid contents.

A proportion of ovarian cysts are cancerous (malignant). Pregnancy, breastfeeding, usage of the oral contraceptive pill, previous sterilisation and removal of the uterus are associated with a lower chance of developing ovarian cancer.

Risk factors include:

- Older age
- Previous history of breast cancer
- Family history of ovarian cancer
- Obesity
- Taking hormone replacement therapy

However, as many people who develop cancer have no risk factors, it is imperative that all women with ovarian cysts are properly evaluated for this possibility.

### Symptoms

The majority of ovarian cysts are asymptomatic. Larger ovarian cysts may twist or rupture, resulting in acute abdominal pain, nausea and vomiting. Patients with endometriotic cysts may present with painful menses (dysmenorrhoea) and intercourse (dyspareunia).

Other symptoms include menstrual irregularities, bloatedness, lower abdominal discomfort, loss of appetite or weight, and passing urine more frequently or change in bowel habit (constipation or diarrhoea) due to compression from the cyst.

As ovarian cancer tends to develop insidiously with vague symptoms, the above symptoms should not be ignored, especially if they are new or experienced on a frequent basis.

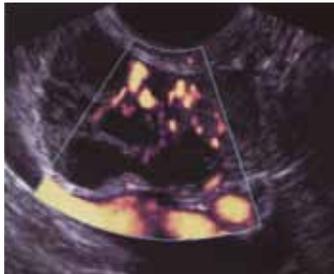
### Investigations

Ultrasound is the preferred method for characterising ovarian cysts. Features such as solid areas, multiple internal compartments, irregular margins and high velocity blood flow increase the index of suspicion for ovarian cancer.

A blood test for CA125 may be taken if there is concern about malignancy. This blood protein is frequently raised in ovarian cancer, but must be interpreted in conjunction with symptoms and ultrasound findings as it can also be raised in non-cancerous conditions such as endometriosis and fibroids.

## Management

Management depends on your symptoms, characteristics of the cyst and results of blood tests.



Using a doppler to help determine the character of a cyst.

Small asymptomatic ovarian cysts that have no suspicious features on ultrasound may be managed expectantly. This usually involves a follow-up ultrasound scan in about three to four months to monitor for any change in size or appearance of the cyst.

Surgery will be recommended if the cyst is symptomatic or has abnormal features.

**Laparoscopy (keyhole surgery)** is the approach of choice if the risk of malignancy is low, as it is associated with less post-operative pain and a faster recovery.

**Laparotomy (open surgery)** may be recommended if you have had previous surgery, if the cyst is large or if it has suspicious features.

**Cystectomy** involves removal of the cyst with preservation of normal ovarian tissue. This is usually done for pre-menopausal women in order to conserve ovarian tissue for reproductive and hormonal function.

**Oophorectomy** is the surgical procedure to remove the entire ovary. Post-menopausal women will usually be offered removal of both ovaries as this has the advantage of reducing the risk of developing ovarian cancer or cysts in the future.

If the risk of ovarian cancer is high, your doctor will discuss frozen section and surgical staging.

Frozen section involves sending the excised ovarian tissue for microscopic examination while you are still under general anaesthesia. If this test reveals malignant cells and you have given prior consent, your surgeon may then proceed to perform a full staging surgery as part of the treatment for ovarian cancer. This involves removing the uterus, both fallopian tubes and ovaries, the omentum (a layer of fatty tissue that covers the abdominal contents like an apron) as well as lymph nodes.

# Polycystic Ovary Syndrome

**Polycystic Ovary Syndrome (PCOS) is the most common endocrine disorder affecting 5-15% of women in the reproductive age. It is characterised by chronic anovulation, hyperandrogenism and polycystic ovaries.**

PCOS is a complex condition that may require management by a multidisciplinary team. Despite the fact that no cure is available for this condition, good control of the

symptoms can be achieved with lifestyle and dietary modifications. PCOS should be diagnosed early to promote long-term health and prevent metabolic and cardiovascular complications.

## Causes

The exact causes remain unclear but more than one can be involved. Genetic and environmental contributors combined with obesity, ovarian dysfunction and hormonal changes contribute to PCOS.

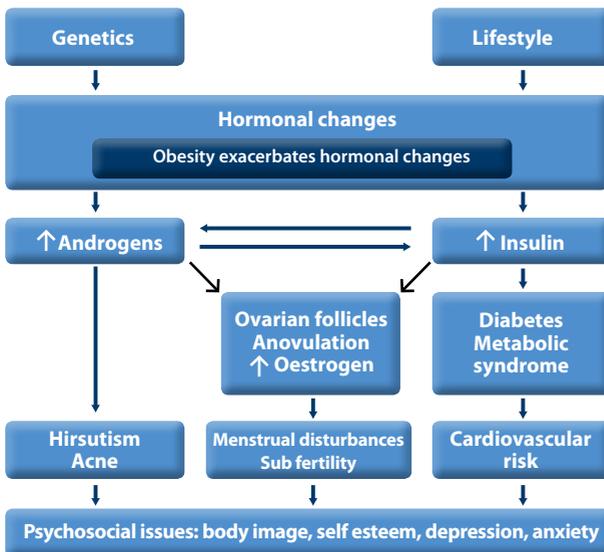


Figure 1. The aetiological, hormonal and clinical features of polycystic ovary syndrome.

*Adapted and reproduced from Teede et al. with permission from the Royal Australian College of General Practitioners. (Teede HJ, MJA 2011)*

## Symptoms

### Menstrual irregularities

Approximately 60-70 percent of women with PCOS exhibit menstrual dysfunction related to anovulation. The most common abnormalities are infrequent periods (oligomenorrhoea) and absence of period (amenorrhoea). Frequent and prolonged periods (polymenorrhoea) are very uncommon (less than two percent). One quarter of patients have regular periods.

### Skin problems

They are either markers of hyperandrogenism (excessive production of male hormones) or insulin resistance.

#### 1. Hirsutism

It is the growth of terminal hairs on the face or body in a male pattern. It is the most important feature of PCOS, affecting 65-75 percent of women and varies with ethnicity.

#### 2. Acne

Acne persisting beyond adolescence and oily skin can be clinical signs of hyperandrogenism. Its prevalence in PCOS is 12-14 percent.

#### 3. Acanthosis Nigricans

It is a marker of insulin resistance occurring in 1 to 3 percent of women and manifests as dark and thickened, pigmented areas of skin commonly affecting the underarm, neck, perineum or skin surfaces of the elbow and knuckles.

### Infertility

The difficulty in conceiving is mainly due to chronic anovulation. PCOS accounts for approximately 75 percent of anovulatory subfertility.

### Obesity

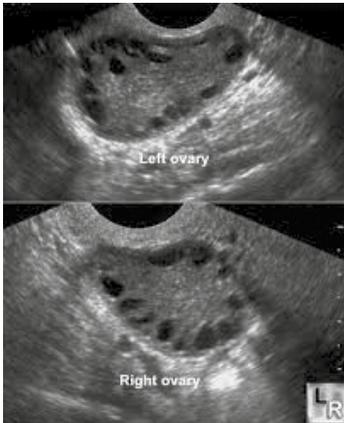
Obesity is often associated with PCOS (30-70 percent), but many patients with PCOS are of normal weight.

## Diagnosis

### The diagnosis criteria follows the 2003 Rotterdam diagnosis consensus workshop:

The diagnosis of PCOS is present if any two out of the following three criteria are met and other hormonal conditions are excluded:

- **Oligo- or Anovulation** usually diagnosed when menstrual cycles are longer than 35 days and/or the progesterone level in the late luteal phase is low
- **Clinical and/or biochemical signs of hyperandrogenism** diagnosed when the clinical markers of hyperandrogenism mentioned above are present and/or total or free testosterone level is elevated
- **Polycystic ovaries** visualised on the pelvic ultrasound, defined by the presence of 12 or more follicles 2-9 mm in diameter and/or an increased ovarian volume > 10 ml (without cyst or dominant follicle in either ovary)



Polycystic ovaries on ultrasound.

And exclusion of other causes such as pregnancy, thyroid diseases, hyperprolactinemia, congenital adrenal hyperplasia, hypothalamic amenorrhoea, premature ovarian insufficiency, androgen secreting tumour, Cushing syndrome and acromegaly.

### Long-term risk

- **Weight gain/obesity**
- **Insulin resistance and type 2 diabetes (T2DM)**  
Adolescents and adult women with PCOS are at increased risk for Impaired Glucose Tolerance (IGT) and T2DM. A diagnosis of PCOS confers a 5- to 10-fold increased risk of developing T2DM. The use of an Oral Glucose Tolerance Test - OGTT (consisting of a fasting and a 2-hour glucose level using a 75 g oral glucose load) is recommended to screen for IGT and T2DM.
- **Cardiovascular disease**  
Women with PCOS should be screened for the following cardiovascular disease risk factors: family history of early cardiovascular disease, cigarette smoking, IGT/T2DM, hypertension, dyslipidaemia, obstructive sleep apnoea, and obesity (especially increased abdominal fatty tissue).

- **Endometrial cancer**

Women with PCOS have a three-fold increased risk of developing an endometrial cancer (cancer of the inner lining of the uterus). There is currently no data supporting routine endometrial biopsy of asymptomatic women or ultrasound screening of the endometrium. However, women should be counselled to report unexpected bleeding and spotting.

- **Depression and mood swings**

Women with PCOS should be screened for depression and anxiety by history and, if identified, appropriate referral and/or treatment provided.

## Treatment

### Oligomenorrhoea/Amenorrhoea/ Prevention of endometrial cancer

To prevent endometrial cancer, a woman should have at least four to six periods in a year. This can be achieved through the following methods:

1. **Lifestyle changes**

Management of lifestyle habits should be the first-line therapy for all women with PCOS and the

target should be a weight loss (5-10 percent) in women with a body mass index (BMI)  $\geq 25$  kg/m<sup>2</sup> and a prevention of weight gain in women with a BMI 18.5-24.9 kg/m<sup>2</sup>. The program should include both reduced dietary energy intake and regular exercise.



Change your lifestyle to prevent endometrial cancer.

2. **Oral contraceptive pill (OCP)**

It would preferably be a 30 µg Ethinyl Estradiol containing pill for its impact on insulin resistance. OCP is used when hyperandrogenism is associated and/or contraception is needed.

### 3. Cyclic progestogens

They should be used when contraception is not required and there are no signs of hyperandrogenism. Dydrogesterone or Medroxy Progesterone Acetate is usually used for 10-14 days every two to three months.

### 4. Metformin and Thiazolidinedione (glitazones) but they are not as efficient as initially shown.

#### Hirsutism

Choice of options depends on the patient's preferences, impact on wellbeing, and access and affordability:

1. Self-administered and professional cosmetic therapy are first-line (laser recommended).
2. Eflornithine cream can be added and may induce a more rapid response.
3. Pharmacological therapy can be considered if cosmetic therapy is not adequate/affordable. The therapy chosen should be maintained for at least six months before changing dose or medication and a combination of therapies can be used.

The following options are available:

- OCP as a first-line in absence of contraindications.
- Anti-androgen (Spironolactone or Cyproterone acetate) in combination with an adequate contraception related to their teratogenic effect.

#### Infertility

1. Lifestyle intervention would be the first line of treatment to optimise preconception health and fertility and reduce pregnancy and long-term complications.
2. Patients should be advised for folates supplementation, smoking cessation before conception.
3. Infertility therapies may include:
  - **Clomiphene Citrate** (CC) as the first-line. Standard practice is to titrate clomiphene citrate doses up to 150 mg/day. If ovulation is not achieved at this point, clomiphene citrate resistance is reached. If a pregnancy is not achieved after six ovulatory cycles with clomiphene citrate, this is termed a state of clomiphene citrate failure.

Studies with clomiphene citrate show ovulation rates of 60–85 percent and pregnancy rates of 30-50 percent after six ovulatory cycles.

- **Metformin** should be combined with CC to improve fertility outcomes in women who are CC resistant, or immediately if BMI  $\geq$  30 kg/m<sup>2</sup>.
- As a second-line, the three following options should be discussed with the patient:
  - Ovulation induction with **Letrozole** (Aromatase inhibitor which has shown its efficacy in ovulation induction but in an off-label fashion) or **gonadotropins** (daily sub-cutaneous injection),
  - **Laparoscopic ovarian drilling** (procedure whereby a few holes, generally four are created at the surface of the ovary by a monopolar needle. Ovulation is achieved in 70-80 percent of cases) or

- **Bariatric surgery** for PCOS obese patients with a BMI  $\geq$  35 kg/m<sup>2</sup>, who are anovulatory, and who remain infertile despite undertaking a structured lifestyle management program for a minimum of six months.
- **In-vitro fertilisation** will be considered as the last resort.

### **Cardio-metabolic risk**

1. Lifestyle changes: A weight loss of more than 5 percent, in overweight patients, reduces diabetes risk by approximately 50-60 percent in high-risk groups.
2. Optimise cardiovascular risk factors (Cholesterol and Glycemia)
3. Consider Metformin (reduces the risk of diabetes by approximately 50 percent in adherent high-risk groups)
4. Bariatric surgery for PCOS obese patients with a BMI  $\geq$  35 kg/m<sup>2</sup>, who have at least one metabolic or cardiovascular complication and who maintain their weight despite undertaking a structured lifestyle management program for a minimum of six months.

# Infertility

**Infertility is the inability to get pregnant after one year of trying. It is a common problem that can affect 1 in 7 couples. 80% of couples having regular sex should conceive within one year.**

To get pregnant, there are several processes that must happen. The woman's body must release an egg from one of her ovaries (ovulation). This egg must go through a fallopian tube toward the womb. The man's sperm must travel through the vagina, womb and go through the fallopian tube to join with (fertilise) the egg. Then the fertilised egg (embryo) must attach to the inside of the uterus (implantation). Anything that may hinder or interfere with any of these steps may cause infertility. In about 30 percent of couples, no obvious causes of infertility can be found.

## Common causes

### Female

- **Damaged or blocked tubes** hence preventing the sperm and egg from meeting.
- **Problems with ovulation** such as polycystic ovary syndrome (PCOS) where few or no eggs are released.
- **Endometriosis**, a condition which causes distortion to the female anatomy that can affect the fallopian tube function or may cause a hostile environment that may interfere with fertilisation.
- **Fibroids and polyps** that can distort the cavity of the womb and impair implantation.
- **Premature ovarian failure** such that eggs are no longer released. This can occur naturally or as a result of chemotherapy or radiotherapy.
- **Age** as the number and quality of eggs diminish with age.

### Male

- **Low sperm count or poor sperm motility** which may be a genetic cause. This means fewer sperm manage to get to the fallopian tubes to meet the egg.
- **Absent or no sperm.** This may result from obstruction in the vas, the tube that delivers the sperm from the testis to the penis, or due to impaired sperm production in the testis.

- **Erectile dysfunction, retrograde ejaculation** resulting in failure of delivery of sperm in the vagina.

## Prevention

**For women, try to conceive when you are still young.** Fertility starts to fall at age 34 and diminishes further at age 37, falling quite drastically after 40. Fibroids and endometriosis can occur at any age but tend to be more common in older women.

**Damaged tubes in the female and blocked vas in the males** may occur as a result of sexually transmitted

infection (STI). Condom use can protect against STI. If you have an infection, seek treatment early.

**Certain infections** such as mumps can cause inflammation of the testis and impair sperm production. That is why most children are vaccinated against mumps.

**Problems with ovulation** may be due to hormonal disturbance. If you have irregular infrequent periods, see your doctor to see if these hormonal imbalances, for example thyroid dysfunction, can be corrected.

**If you have period pains and painful sex,** see your doctor so that, if necessary, treatment can be instituted for endometriosis and fibroids.

**Certain lifestyle issues** like smoking and being under or overweight can also affect fertility.



Fertility starts to fall at 34.

## Diagnosis

If you have not conceived after one year of regular intercourse without the use of any contraception, it is recommended that you see a doctor. The age of a woman is an important consideration as both the number and quality of eggs decline with age. Hence, it is important to seek medical help early especially if the woman is over 35 years old.

Your doctor will be able to run some tests to identify where the problem may be.

**For the female partner**, hormonal tests are performed to look for ovarian reserve and to assess for ovulation.

For women who have irregular cycles, hormone tests for thyroid and prolactin levels are also checked.

An ultrasound scan can easily identify any fibroids or cysts. A hysterosalpingogram or ultrasound saline infusion may be offered to assess tubal patency.

Infertility is a common problem. There are many types of treatment tailored to every couple depending on what the cause may be. Seek treatment early as success depends on the age of the female partner.



Fibroids or cysts can be identified by an ultrasound scan.

**For men**, the semen test is performed after abstinence of three to five days.

## **Treatment**

Treatment is directed at the underlying problem.

### **Damaged or blocked tubes**

Under certain circumstances, surgery or cannulation of the tube may 'open' up the tubes. If despite treatment, there is no conception or the tubes cannot be unblocked, then in-vitro fertilisation (IVF) will be the treatment of choice.

### **Problems with ovulation**

Problems with ovulation such as polycystic ovary syndrome (PCOS). Patients with PCOS who are overweight should lose weight as this may lead to resumption of ovulation. Ovulation induction with clomiphene, letrozole or FSH injection may also be used.

### **Endometriosis**

Patient with large endometriotic cysts (>5 cm) or with severe pain may consider surgery. If there is still no conception 6-12 months post-surgery, then IVF may be the next step. As endometriosis tends to recur,

it is advisable to consider medical treatment to prevent recurrence if fertility is not desired.

If the cyst is not large or there is a recurrent cyst after surgery, then IVF should be considered. This is because repeated operations can reduce the ovarian reserve as ovarian tissue may be removed during surgery.

### **Fibroids and polyps**

Fibroids and polyps that distort the womb cavity can be removed through the hysteroscope, a telescope that allows visualisation of the womb cavity. The camera is introduced through the vagina.

### **Premature ovarian failure**

Premature ovarian failure such that eggs are no longer released. Under these circumstances, an egg donor or embryo donor is necessary as there is no treatment of this condition. Prior to any cancer therapy, women and men are counselled about how they can preserve their fertility. Men can bank their sperm and women can bank their eggs, ovarian tissue or embryo for future use.



If you are over 35 and have been trying for a baby for 6 months – See a doctor.

### **Age**

The number and quality of eggs diminish with age. There is no medication that can reverse the effects of age and that is why for women older than 35, infertility investigations may commence after six months of trying.

### **Low or no sperm**

Hormonal or chromosomal tests may be performed to find the underlying cause. In a small percentage of men, the cause is hormonal and replacement of hormones may allow the resumption of sperm production

For men with low sperm count, intracytoplasmic sperm injection where sperms are injected directly into the egg at IVF will give the sperm the opportunity to fertilise the egg.

For men with no sperm, sperm may be obtained directly from the testis or epididymis. As the number of sperm retrieved are low, IVF/ICSI is necessary. For those where no sperm is retrieved, sperm donation can be considered.

For men with erectile dysfunction, psychosocial counselling and medication like Viagra may be helpful.

## Other treatments

### Intrauterine insemination (IUI)

This is a treatment where washed sperm is introduced into the womb with a cannula at the time of ovulation. This is indicated for women with patent tubes, with mild sperm problem or couples with problem of non-consummation or erectile dysfunction.

IUI may also be performed together with ovulation induction with hormonal injection. This is ideal for couples where the women are younger (<35) with patent tubes and no or mild male factor problem. This may also be for couples with ovulation problems or where no known cause is found.

### In-vitro fertilisation (IVF)

IVF is a procedure where eggs are retrieved from a woman and are inseminated with the husband's semen in the laboratory. The resultant embryo is then placed back into the womb.

To make IVF more efficient, hormonal injections are given to the woman to induce more eggs so that it allows for more opportunities for the eggs to be fertilised. IVF is indicated for the following problems:

1. Blocked tubes
2. Failure of ovulation with ovulation induction or failure to get pregnant despite ovulation induction
3. Treated endometriosis or endometriosis with small cysts (<5 cm)
4. Donor egg or sperm cycles
6. Surgical retrieved sperm or very low sperm counts
7. No known cause but no conception after three years of trying (female <35 years old) but may be sooner for those older than 35

Despite advances in IVF, the chances of conception vary from 20-35 percent depending on a woman's age. In Singapore, IVF is not allowed once a woman is over 45 because the chance of success is very poor.

# Cervical Cancer

**The newly available global cancer statistics show that, in 2012, cervical cancer is the third commonest cancer among women. In Singapore, cervical cancer has shown a declining incidence over the last three decades but remains one of the most common top 10 cancers in women.**

**Every year, more than 200 Singaporean women are diagnosed with cervical cancer and 100 women die from it.**

## **What is cervical cancer?**

- Cervical cancer is a malignant tumour or growth arising from the cervix.
- The cervix or 'neck of the womb' is the lower portion of the uterus that opens into the vagina.
- Early cancer is silent.
- Advanced cancer may show the following symptoms:
  - Irregular vaginal bleeding
  - Foul smelling or blood-stained vaginal discharge
  - Bleeding during or after sexual intercourse



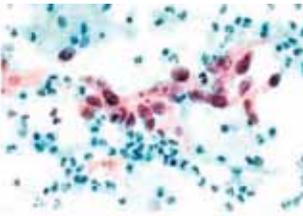
Normal cervix  
viewed from vagina.



Cervical cancer.

## How can cervical cancer be detected early?

- On inspection and palpation of the cervix during an examination of the pelvis, a doctor may detect a lump in the cervix and raise a suspicion of an early cancer.
- A very early cancer before it is visible to the naked eyes can be detected on a screening Pap smear test and the diagnosis confirmed on a special examination known as colposcopy.



Pap smear test detected abnormal cells.

- Early cervical cancer carries a very good cure rate. In young women, treatment can be tailored to preserve fertility.



Early cancer detected.



Colposcopy.

## Can cervical cancer be prevented?

**Yes! Most cases of cervical cancer can be prevented.**

- Cervical cancer has a unique natural history in its development. There are abnormal cellular changes in the cervix before a cancer develops. These abnormal changes are known as cervical pre-cancer or cervical intraepithelial neoplasia (CIN). Successful treatment of CIN removes a woman's risk of developing cervical cancer.
- Infection by certain strains of human papillomavirus (HPV) is necessary for the development of CIN or cervical cancer. The most important cancer-inducing HPV strains are HPV-16 and HPV-18. HPV infection is common in young women after sexual debut.

**Vaccination during adolescence against these HPV infections is an effective method in reducing a woman's risk of cervical cancer in the later years of life.**

## What should I do to prevent cervical cancer?

Your life is in your hands. Depending on your age, you may take the following strategies to protect yourself against cervical cancer:

### HPV vaccination:

- In Singapore, HPV vaccines are licenced for females between 9 and 26 years old. A full vaccination includes three vaccine doses spread over a six-month period. Vaccine efficacy is extremely high for women who have never been exposed to HPV-16 and HPV-18 infection and the protection period is long-lasting. More than two hundred million doses of vaccines have been administered to girls and women worldwide since 2006. Records have shown that the safety profile of these vaccines is very good. Development of vaccine related severe medical adverse events is rare.
- HPV vaccination is currently available at restructured hospitals, polyclinics and private clinics.
- HPV vaccination is Medisave claimable.

### Cervical cancer/CIN screening:

- The role of screening is to detect CIN and/or cervical cancer before they become an obvious disease.
- SGH spearheaded a new screening program incorporating the Pap smear and HPV DNA testing for HPV-16, HPV-18 and 12 other cancer inducing HPV strains in 2013. This new screening method combines the advantages of Pap test and HPV test in the same setting, and allows CIN to be detected early and thus reduces the incidence of cervical cancer.

If a woman has a negative test, her risk for cervical cancer is extremely unlikely in the next decade. She can confidently lengthen her screening interval to five years. This has been shown to be more cost-effective than conventional Pap smear screening alone.

- There are three possible outcomes of screening:
  - **No abnormality detected.**  
Go for the next screening test in five years.
  - **Mild abnormality is present.**  
Requires a follow-up test in one year.



All women should be screened.

- **Abnormal results.**  
This warrants further investigation with colposcopy.

### Who should go for screening?

- Screening targets women, 25 years or older, who have experienced sexual intercourse.
- Screening is recommended regardless of previous HPV vaccination.
- Screening is for all women, regardless of family history of cancer, history of pregnancy and childbirth, number of sexual partners, method of contraception, and habits of cigarette smoking.
- Screening is repeated five-yearly if she remains well, has no abnormal changes in vaginal bleeding or

discharge, and has no abnormal findings of the cervix on routine medical examination.

- Screening should continue after menopause regardless of cessation of sexual intercourse.
- Screening can cease if a woman has an operation to remove her uterus.

### Timely eradication of CIN:

- Cancer development can be prevented only if CIN is treated early.
- In 75 percent of cases, CIN of grade-2 or grade-3 severity can be effectively treated with a simple surgery known as LEEP or Loop Electro-Excision Procedure.

#### LEEP treatment:



(a) CIN on colposcopy (b) LEEP in progress



(c) CIN removed (d) Healed cervix 6 weeks after LEEP

- This is an office procedure done with local anaesthetic.
- Approximately 25 percent of cases of grade-3 CIN are treated with a surgery known as cone biopsy. In this procedure, a central portion of the cervix is removed. In most instances, the surgery is done with laser surgery in an operation suite.
- In more than 90 percent of cases CIN is successfully cured with one treatment only. The remaining cases are cleared of CIN in subsequent treatments.

**If I have screening tests at five-year intervals, should I continue with my yearly gynaecological check-ups?**

You should not change your routine visit to your gynaecologist. Although your cervical cancer screening is done at five-yearly intervals, you still need to see your gynaecologist for a number of reasons, for example:

- Screening of other diseases
- Managing menstrual problems, contraception, or fertility issues
- Treatment of genital infection
- Managing menopausal issues



Continue your regular gynaecology check-ups.

# Pelvic Organ Prolapse

**The pelvic organs include the uterus, urethra, bladder, rectum and the vagina. These organs are all supported by the muscles of the pelvic floor and connective tissue called fascia.**

Prolapse occurs when this support structure is weakened through various factors, like direct muscle trauma, neuropathic injury, disruption or stretching. In most cases, a combination of factors causes this damage.

The descent of one or more pelvic organs results in a protrusion of the uterus and/or vaginal wall, which may manifest as urinary, bowel, sexual or pelvic symptoms.

## Causes

- **Age.** With increasing age, fascial tissues become stiffer and more liable to rupture and damage.
- **Pregnancy and childbirth.** During pregnancy, the fascia becomes more elastic and the pelvic floor may be damaged during childbirth.
- **Hormonal factors.** The effects of ageing and oestrogen withdrawal at menopause cause the fascia to be less elastic and more easily damaged.
- **Smoking.** Chronic chest disease resulting in a chronic cough leads to an increase in the intra-abdominal pressure and exposes the pelvic floor to greater strain.
- **Constipation.** Repetitive straining causes chronically increased intra-abdominal pressure.
- **Obesity.** This also causes increased intra-abdominal pressure.
- **Exercise.** Frequent heavy lifting and exercises such as weightlifting, high-impact aerobics and long-distance running also increase the risk of urogenital prolapse.



Frequent long-distance running can increase the risk of prolapse.

## **How do I prevent pelvic organ prolapse?**

Pelvic floor exercises taught and practised early, before menopause, can help in reducing the incidence of prolapse.

Other preventive strategies include avoiding factors that will result in chronic increased intra-abdominal pressure such as smoking,

constipation and heavy lifting. It is also important to keep within the recommended body mass index to prevent obesity.

## **Symptoms**

Most women complain of the sensation of 'a lump coming down' or a feeling of discomfort or heaviness within the pelvis. The symptoms tend to worsen with prolonged standing and towards the end of the day.

Other complaints include pain during intercourse and chronic backache. Urinary symptoms like urgency, frequency of urination and a sensation of incomplete emptying may be experienced if the bladder is affected.

If the rectum is involved, women may complain of difficulty in opening the bowels and having to reduce the prolapse manually before passing motion.

## **Diagnosis**

You will be referred to a urogynaecologist who will examine you and grade the degree of pelvic organ prolapse.

Additional tests may be needed, depending on the degree of prolapse and other additional symptoms noted by the patient. These include bladder urodynamics studies, a urethral pressure profile, and an ultrasound of the gynaecological organs or the urinary system.

### **The different grades of pelvic organ prolapse**

The grading of pelvic organ prolapse is as follows:

#### *First degree:*

The lowest part of the prolapse lies above the introitus (opening of the vagina).

#### *Second degree:*

The lowest part of the prolapse extends to the level of the introitus on straining.

#### *Third degree:*

The lowest part of the prolapse extends through the introitus and lies outside the vagina.

### **Treatment**

Conservative management options include:

- **Pelvic floor exercises**

There is a role for pelvic floor exercises in younger women with mild prolapse who find intravaginal ring pessaries unacceptable and are not yet willing to consider surgery, especially if they have not yet completed their family.

- **Intravaginal ring pessaries**

Ring pessaries vary in size and are fitted to each patient according to her vaginal size. It lies within the vagina and has to be changed every four to six months.

Surgical options vary according to the type and degree of prolapse:

- **Pelvic floor repairs**

If the urethra, bladder, rectum or intestines protrude through the vaginal wall, the pelvic floor will be repaired and strengthened with sutures to correct the prolapse and replace the organs back to their original position.

- **Vaginal hysterectomy**

This is indicated when the uterus protrudes through the vaginal opening. The uterus is removed via the vaginal route.

- **Mesh repair**

This may be indicated in cases of severe prolapse, to enhance the degree of support to the pelvic floor, preventing a future recurrence. A synthetic mesh is placed beneath the vaginal skin after reducing the pelvic organs back to their original position.

- **Sacrospinous ligament fixation**

This is done in cases of severe uterine prolapse, to suspend the vaginal vault to the sacrospinous ligament and thus reduce the chance of prolapse recurrence.

There are a myriad of surgical techniques and this list is by no means exhaustive. The specific surgical procedure can only be advised by a urogynaecologist after assessing the patient.

# Urinary Incontinence

**Urinary incontinence is the involuntary leakage of urine. It is a common condition that can affect the physical, psychological and social well-being of those affected, as well as their families and caregivers.**

## **Types of incontinence and their causes**

### **Stress incontinence**

There is involuntary leakage of urine on effort or exertion e.g. sneezing or coughing. It is usually caused by an incompetent sphincter and weak pelvic outlet from previous trauma, previous pregnancies, or increased abdominal pressure such as constipation, obesity and chronic cough.

### **Urge incontinence**

There is involuntary leakage of urine accompanied by, or immediately preceded by, the urgent need to empty your bladder. This is due to the involuntary and inappropriate contractions of the muscles in the wall of the bladder. The cause is usually unknown but may also be caused by local irritation from urinary tract

infection, bladder stones or bladder tumour. Other uncommon causes include stroke, Parkinson's disease, multiple sclerosis, dementia or spinal cord injury.

### **Overactive bladder syndrome (OAB)**

There is urgency that occurs with or without urge incontinence. It often involves daytime frequency and the need to wake up at night to urinate. It is a diagnosis of exclusion – when no identifiable cause is found.

### **Mixed incontinence**

There is involuntary leakage of urine associated with both urgency and exertion – mixed features of stress and urge incontinence.

### **Overflow incontinence**

This is usually due to chronic bladder outflow obstruction – when the bladder is very full but unable to empty. It may be more common in diabetic or stroke patients. It also occurs commonly after deliveries or pelvic surgeries. It can affect kidney function if left untreated. Therefore, early assessment and intervention are required.

## True incontinence

There is continuous leakage of urine. This may be due to a fistulous track between the vagina and the ureter, or bladder, or urethra, which may be caused by infection, tumours or previous surgery.

## Risk factors

- Pregnancy
- Previous vaginal deliveries, including forceps deliveries
- Obesity
- Menopause may play a role
- High caffeine intake may worsen the problem

## Preventive tips

- Pelvic floor exercises should be taught and practised by women during pregnancy.
- Weight control in obese women may reduce the risk of developing incontinence.
- Stop smoking to prevent chronic smoker's cough.
- Reducing intake of coffee, tea and other caffeinated drinks may reduce the symptoms of urge incontinence.

## Diagnosis

The diagnosis is usually made after your doctor has taken a complete history and performed a thorough physical examination. Basic and further investigations will be planned depending on the initial assessment.

History taking involves asking you questions about your symptoms, details about your previous pregnancies, medical and surgical history and medications. Your doctor may also enquire about sexual history and how your condition may have affected your daily activities and quality of life. You may also be asked to complete a bladder diary for up to three days, including both working days and days off.



Limit intake of coffee to reduce symptoms of urge incontinence.

Abdominal and pelvic examination will be performed to assess for any possible tumours, co-existing pelvic organ prolapse, strength of pelvic floor muscle contraction or signs of vaginal atrophy. An erect stress test – where the patient will be asked to stand on an incontinence sheet and cough about 10 times, to assess for any urinary leakage, is usually performed. If necessary, a neurological examination may also be performed.

Further tests will be ordered after the doctor's initial assessment.

Most commonly, a urine dipstick test to look for blood, glucose, protein, white blood cells and nitrites will be done. Urine cultures to exclude urinary tract infection may also be part of the initial assessment.

Post-void residual urine volume should be measured in women who have symptoms suggesting voiding dysfunction or recurrent urinary tract infections. This may be performed using a bladder scan or catheterisation.

For some people, urodynamics studies, a complex assessment of changes in bladder activity during filling and emptying, may be required to confirm the diagnosis and decide on treatment options, especially if surgery for urinary incontinence is considered.

## **Treatment**

In general, lifestyle modifications such as weight control in obese patients and reduction of caffeine intake may help to reduce symptoms of stress, urge or mixed urinary incontinence.

### **1. Stress urinary incontinence**

#### **Non-surgical options**

- Pelvic floor exercises
  - Commonly known as Kegel exercises, these help to strengthen the pelvic floor muscles and if done correctly and consistently, it can improve the quality of life of 60 percent of women with stress incontinence.
  - A trial of supervised pelvic floor exercises for a minimum of three months remains the first-line treatment for women with stress or mixed urinary incontinence (NICE guideline).



Pelvic floor exercises can help with stress incontinence.

### Surgical options

Surgery is the mainstay of treatment for stress incontinence when conservative management has failed. Your childbearing wishes also have to be considered before surgery. The following surgical procedures have high success rates of up to 80 to 90 percent but also have risks including but not limited to bladder, vaginal wall and bowel injuries, urinary retention and infection. They should only be undertaken by a trained and accredited surgeon.

- Synthetic mid-urethral tape
  - Slings of man-made mesh are used to support the urethra. The most common type in use is tension-free vaginal tape (TVT). Other versions of slings used include TVT-O, TVT-exact and TVT-abbrevo.
- Open colposuspension
  - Most commonly known as Burch colposuspension, where surgical sutures are used to support the bladder neck.
- Autologous rectus fascial sling
  - Newly added recommendation by NICE guideline 171, 2013.

Other options such as vaginal devices, collagen injections and artificial urinary sphincter are not recommended as first-or second-line treatment strategies.

## 2. Urge incontinence and overactive bladder

### Lifestyle modifications

- Reduction of coffee and tea intake may help to reduce symptoms.

### Medications

- First-line treatment drugs are anticholinergics. They act to block the nerve signals which cause frequent urination and urgency, and bladder spasms. Your doctor will initially start with the lowest recommended dose and review you after a month. The main side effect is mouth and throat dryness. They are contraindicated in women with glaucoma.
- Second-line medications may be recommended if you are unable to tolerate the side effects of anticholinergics.
- Intravaginal oestrogens may be prescribed for postmenopausal women with vaginal atrophy.

### Other options

These treatment modalities may only be considered for those who have failed the above medical treatments.

- Injections of botulinum toxin A into bladder wall

- Neuromodulation – percutaneous sacral nerve stimulation
- Augmentation cystoplasty
- Urinary diversion

## 3. Mixed incontinence

Treatment should be directed towards the predominant symptom, but may involve a combination of approaches.

- Pelvic floor exercises and bladder training, as above, are first-line treatments.
- Anticholinergics such as oxybutynin can be started if the above are not effective.
- Regular review and follow up should be undertaken.

## 4. Overflow incontinence

- Relieve or treat the cause of bladder outlet obstruction
- Intermittent self-catheterisation or long-term indwelling catheterisation (either urethral or suprapubic) may be required

***Ladies, do not suffer in silence. Please seek medical help early to improve your quality of life.***

# Urinary Tract Infections

**Urinary tract infections occur when bacteria is present within the urinary tract in significant numbers. UTIs are common in women, with 1 in 5 adult women aged 20-65 experiencing a UTI at least once a year. Approximately 50% of women will experience UTIs at least once in their life.**

Cystitis (bladder infection) makes up the majority of these infections. Involvement of the upper urinary

tract (pyelonephritis) is less common compared to that of cystitis but can be associated with more serious complications.

## **Causes**

In most cases of uncomplicated cystitis the *Escherichia coli* is involved. This bacteria is present in 70-95 percent of both upper and lower UTIs. Other common pathogens are *Enterococcus faecalis*, *Klebsiella species*, *Proteus species* and yeast.



About 50 percent of women will experience UTIs at least once.

## What are the predisposing factors?

The largest group of patients with UTIs is that of adult women. Women are more prone to UTIs than men because in females, the urethra is much shorter and closer to the anus.

Other predisposing factors include:

### 1. Menopause

Rates of UTIs are higher in postmenopausal women for a few reasons. For one, the presence of bladder or uterine prolapse can cause incomplete bladder emptying and stasis (reduced or stoppage flow) of urine which in turn promotes the growth of pathogens. Also, the loss of oestrogen after menopause leads to changes in the vaginal flora, especially the loss of lactobacilli, and increases your susceptibility to infection.

### 2. Sexual activity

UTIs are very common in women aged 18-30 years as it is associated with coitus (the so-called 'honeymoon cystitis'). In this age group, sexual intercourse is the cause of 75 to 90 percent of bladder infections, with the risk of infection

being related to the frequency of sex. The use of spermicides and diaphragms for contraceptive purposes further increases the risk of UTIs as it causes a change in the vaginal flora and eradication of the vaginal lactobacilli.

### 3. Recent instrumentation of the urinary tract (e.g. catheterisation, cystoscopy, urodynamic studies)

The insertion of foreign instruments into the urinary tract promotes the translocation of bacteria colonised around the peri-urethral area into the bladder and other parts of the urinary tract. This increases the risk of developing bacteruria (presence of bacteria in the urine) in significant numbers eventually leading to a UTI.

### 4. Foreign bodies (e.g. catheters, urinary stones)

Urinary catheters are the most important risk factors for bacteriuria. Catheters introduce organisms into the bladder and promote colonisation by providing a foreign surface for bacteria to adhere to and by causing irritation of the bladder mucosa. 80 percent of UTIs that occur while in hospitals or

healthcare institutions are related to urethral catheterisation, and 5-10 percent are related to manipulation of the genito-urinary tract. Urinary stones similarly irritate the bladder as well as provide a nidus for bacteria to adhere to, thereby increasing the risk of developing a UTI.

### **5. Neurological disorders, drugs or pelvic organ prolapse**

These conditions may cause incomplete emptying of the bladder, thereby promoting stasis of urine which increases the risk of UTI development.

### **6. Medical conditions (e.g. diabetes)**

Diabetes leading to glycosuria (sugar in the urine) makes for fertile breeding ground for bacteria. A study showed that 9.4 percent of patients with Type 2 diabetes had a UTI compared to only 5.7 percent of people without diabetes.

## **Signs and Symptoms**

The onset of UTI can be associated with one or more of the following symptoms:

- Pain on passing urine (dysuria)
- Urinary urgency
- Urinary frequency
- Sensation of bladder fullness or lower abdominal discomfort
- Fever
- Blood in the urine (haematuria)
- Flank pain and tenderness over the lower back area next to the spine (may suggest involvement of the upper urinary tract)

## **Diagnosis**

The diagnosis of a UTI can be suspected from a well-taken history and physical examination.

Specific tests to confirm a UTI include a urine dipstick, urine analysis and urine culture. The main emphasis lies with the detection of pyuria (white blood cells or pus cells in the urine) on dipstick and urine analysis. Associated findings can include microscopic haematuria (blood in the urine which cannot be detected by the naked eye). A urine culture will help in the identification of the organism causing the infection.

No imaging studies are indicated in the routine evaluation of an uncomplicated cystitis.

## **Treatment**

Empirical antibiotics are usually prescribed for UTIs. The patient may be prescribed alternative antibiotics after the urine culture results are available. The duration of treatment of the UTI depends on the antibiotic in use. Some common first-choice agents for the treatment of uncomplicated cystitis in women include nitrofurantoin, bactrim or beta-lactams such as cephalexins.

Most patients can be treated on an outpatient basis. However, hospital admission for management of complicated UTIs may be indicated in some patients. Complicating factors include the presence of structural abnormalities (e.g. stones, indwelling catheters), metabolic disease (e.g. diabetes, pre-existing kidney disease) or patients who are immunosuppressed and therefore more prone to serious infections (e.g. HIV, patients on chemotherapy).

## **Recurrent UTI**

Recurrent UTI is defined as having UTI three or more times in a year. This can be due to the same or different bacteria. In these cases, further investigations may need to be done, e.g. renal ultrasound, intravenous pyelogram, cystoscopy, urine for tuberculosis and cytology, to look for any underlying causes and complications of recurrent UTIs.

Patients with recurrent UTI may be given prophylactic antibiotics for a period of six months. They will also be advised on the various preventive measures and the importance of keeping good personal hygiene.

## **Prevention**

About 25 percent of women with acute cystitis develop recurrent UTIs. Most recurrent infections are from bacteria present in the faecal or periurethral reservoirs. Some strategies can be undertaken to reduce the risk of recurrent infections.

## 1. Lifestyle changes

- Sexually active women should attempt to void immediately after intercourse to reduce the risk of coitus-related introduction of bacteria into the bladder.
- Wiping from front to back after going to the toilet to avoid faecal contamination of the urinary tract (especially during an episode of diarrhoea).
- Daily consumption of cranberry juice or cranberry tablets.
- Avoid use of diaphragms and spermicide by considering other forms of contraception.
- Avoid use of deodorants and bubble baths.
- Drinking plenty of water.



Drink plenty of water to reduce risk of UTI.

## 2. Prophylactic antibiotics

- A once-daily dose of an appropriate antibiotic may be indicated in patients with a history of multiple episodes of UTI to minimise the risk of recurrence of infection.

## 3. Treatment of any existing structural abnormalities

- If recurrent UTI occurs against a background of structural abnormalities in the urinary tract (e.g. stones, kidney cysts), consideration should be given to the treatment of these conditions to eradicate the source.

## 4. Treatment of any vaginal/lower genital tract infection

- These infections may spread to the urinary tract. As such, they should be treated promptly, if present.

# Vaginitis

**Vaginitis is the medical term for infection or inflammation of the vagina. It is a problem that is commonly encountered in the general gynaecologist's clinic. In some cases, the vulva and cervix may be affected by infection and inflammation as well, giving rise to vulvitis and cervicitis respectively.**

## Symptoms

Common symptoms of vaginitis include vaginal discharge, itch and discomfort.

Some women may also experience dysuria (pain felt on urination), superficial dyspareunia (pain felt on penetration during sex) and spotting (typically after sex or outside of normal periods).

## Causes

The most common causes of vaginitis are bacterial vaginosis, candida (yeast) infection and trichomonas infection. They account for 90 percent of cases. Less common but significant causes of vaginitis are infections caused by sexually-transmitted organisms such as chlamydia, gonorrhoea and herpes.

Not all cases of vaginal discharge are due to infection. Vaginal discharge can be normal ('physiological discharge'). It can also be caused by presence of foreign objects in the vagina, allergic reactions, cervical conditions and rarely genital tract cancer. In postmenopausal women, vaginal discharge is commonly due to atrophic changes ('atrophic vaginitis').

Causes of vaginal discharge		
Infection/ inflammation	Non-infective	
Non-sexually transmitted: bacterial vaginosis, candida	Physiological discharge	Cervical conditions (e.g. polyp, ectropion*)
Sexually transmitted: trichomonas, chlamydia, gonorrhoea, herpes	Foreign object (retained condom, forgotten tampon)	Genital tract cancer
	Allergic reactions	Atrophic vaginitis (postmenopausal)

\* Cervical ectropion is a condition in which the inner cervical cells are found on the outer part of the cervix.

## The vaginal environment and physiological ('normal') vaginal discharge

The normal vaginal environment is a delicate ecosystem of 'healthy' bacteria and small amounts of candida (yeast). The normal pH of the vagina is

usually acidic in nature. Lactobacillus is the main regulator of vaginal pH by making lactic acid. Maintaining the vaginal pH at an acidic level inhibits overgrowth of 'healthy' bacteria and yeast and prevents infections from bad bacteria and viruses.



Age, stress and birth control pills are some factors that can affect the vaginal pH.

Discharge flows from the vagina daily as the body's way of maintaining a normal healthy environment. Normal physiological vaginal discharge consists of cervical and vaginal cells, bacteria, water, electrolytes and other chemicals. Normal discharge is usually clear or white, thick and mucous-like. There may be a slight odour. Vaginal discharge may become more noticeable near ovulation and in the week before the menstrual period.

The vaginal pH can change under the influence of various factors:

- Age
- Stress
- Diabetes
- Medical conditions which cause low immunity
- Hormonal changes (during the menstrual cycle, pregnancy, puberty, menopause)
- Birth control pills
- Intrauterine contraceptive devices
- Douching and other vaginal products
- Vaginal medications
- Antibiotics
- Foreign objects

Disturbance of the normal vaginal pH can alter the composition and balance of the vaginal ecosystem. This leads

to overgrowth of 'healthy' organisms and infections from bad organisms, resulting in vaginitis.

### **How do I know if my vaginal discharge abnormal?**

Although vaginal discharge can be physiological, it is advisable to seek medical advice under any of the following circumstances:

- Change in the nature of vaginal discharge – especially if it is foamy, greenish, foul-smelling or blood-stained;
- Other symptoms such as vaginal itch or discomfort, dysuria, dyspareunia, abnormal spotting, abnormal menstrual periods or abdominal pain;
- New sexual partner or more than one partner in the last year;
- Previous history of sexually-transmitted disease or pelvic infection;
- Recent vaginal or caesarean birth or recent invasive gynaecological procedure e.g. abortion, insertion of an intrauterine device, in-vitro fertilisation etc.

## What you can do to maintain a healthy vaginal environment – Do’s and Don’ts

DO	DO NOT
<p>The vagina has a self-cleaning mechanism. Keep the genital area clean by washing daily with mild soap and water.</p>	<p>Do not wash excessively or use a sponge to clean the genital area. Overcleaning can alter the vaginal pH, cause irritation and worsen vaginitis symptoms. Antibacterial or astringent soaps contain harsh chemicals which may irritate the vagina.</p>
<p>If the genital area is irritated, aqueous cream can be kept in the fridge and dabbed on to cool and soothe the genital area as often as preferred. This would reduce dryness and irritation.</p>	<p>Avoid using the following on the genital area as these can contain irritants: bubble baths, hot baths with scented products, douches, antiseptics, baby wipes, deodorants, some over-the-counter creams (e.g. tea tree oil, aloe vera).</p>
<p>Wear loose-fitting breathable silk or cotton underwear and clothes.</p>	<p>Avoid tight-fitting synthetic underwear (e.g. thongs, lycra) and clothes (e.g. tights, cycling shorts, leggings, tight jeans).</p>
<p>Wipe the genital area with soft white unscented toilet paper. Wipe from front to back to prevent faecal material from coming into contact with the vagina.</p>	<p>Avoid coloured toilet paper as these contain dyes and other potentially irritating chemicals.</p>
<p>Change tampons, sanitary pads and pantyliners regularly as exposure to soiled menstrual products for prolonged periods can increase the risk of infection.</p>	<p>Do not wear sanitary pads or pantyliners on a daily basis.</p>
<p>Seek treatment for incontinence as urine and frequent use of diapers cause genital irritation.</p>	



Bubble baths, baby wipes and hot baths with scented products are some products that can cause irritation in the genital area.

## **Bacterial vaginosis**

**Bacterial vaginosis occurs when lactobacillus in the vagina is replaced by other bacteria. It is the most common cause of vaginitis, accounting for 40-45 percent of cases and usually causes a 'fishy' thin off-white vaginal discharge, which is more noticeable after unprotected sex.**

Although the majority of affected women are sexually active, bacterial vaginosis can occur in women who have never had sex. Other predisposing factors for bacterial vaginosis include oral sex, intrauterine contraceptive devices, vaginal douching and pregnancy.

50 percent of bacterial vaginosis cases do not cause any symptoms and do not need treatment, unless the woman is undergoing gynaecological surgery

or is pregnant and has previous preterm birth. Testing and treatment of male sexual partners is not needed and unhelpful in preventing repeat infection.

### **Treatment**

Treatment of bacterial vaginosis consists of a course of antibiotics and avoiding vaginal irritants. Recommended antibiotics are metronidazole (flagyl) or clindamycin given through either the oral or vaginal route. Avoid using alcohol during treatment with oral metronidazole and for 24 hours thereafter. Metronidazole pills also interact with warfarin.

50 percent of affected women have a repeat episode of bacterial vaginosis within one year. In women who have frequent episodes of bacterial vaginosis, these treatment strategies may be helpful:

- Change of intrauterine contraceptive device or switch to another form of contraception
- Regular use of condoms as semen raises the vaginal pH and disrupts the vaginal ecosystem
- Preventive treatment with antibiotics over 4-6 months.

### **Candidiasis ('yeast infection')**

**Candidiasis occurs when there is an overgrowth of the yeast organism called candida, which is usually found in small numbers in the normal vaginal environment. It is the second most common cause of vaginitis, accounting for 20-25% of cases.**

It usually causes a thick white odourless discharge. Vaginal itch and soreness are also prominent symptoms. Predisposing factors for candidiasis include pregnancy, diabetes and medical conditions which cause low immunity, antibiotics and birth control pills.

20 percent of candidiasis cases do not cause any symptoms and do not need treatment. Testing and treatment of sexual partners is not needed because candidiasis is not considered sexually transmitted.

### **Treatment**

Treatment of candidiasis consists of a course of antifungal medications given by the oral or vaginal route. Vaginal antifungal medications may

weaken latex condoms so additional contraception is needed when the woman is using antifungals. 5 percent of women have recurrent candidiasis (four or more repeat episodes of candidiasis in one year) and may benefit from the following strategies:

- Good control of diabetes
- Switch from birth control pills to another form of contraception
- Preventive treatment with antifungal medications for six months.

## Trichomonas infection

**Trichomonas is a sexually-transmitted parasite with a high transmission rate of at least 70 percent after just one exposure to an infected partner. It is the third most common cause of vaginitis, accounting for 15-20 percent of cases.**

50-75 percent of infected persons have no symptoms. Common symptoms include foul-smelling yellow-green vaginal discharge and vaginal itch.



Untreated trichomonas infection in pregnancy is associated with high risk of preterm birth.

## Treatment

It is important to treat all cases of trichomonas infection, even if there are no symptoms. Trichomonas infection can spread from the vagina to the upper genital tract (i.e. the womb, tubes, ovaries), causing damage which can affect fertility and increase the risk of ectopic pregnancy. Untreated trichomonas infection in pregnancy is associated with a high risk (30 percent) of preterm birth. Testing and treatment of sexual partners is mandatory. Treatment consists of a course of oral antibiotics (metronidazole or tinidazole).

## Atrophic vaginitis

**Atrophic vaginitis refers to a type of vaginitis that occurs because of oestrogen deficiency, usually after menopause. It occurs in up to 40 percent of postmenopausal women.**

Oestrogen stimulates the growth of lactobacilli in the vagina. Lack of oestrogen causes thinning of the vaginal skin and increases the pH of the vaginal environment. This predisposes the genital area to infection.

## Treatment

Because the problem is mainly due to lack of oestrogen, treatment of atrophic vaginitis usually depends on replacing oestrogen in the tissues. Usually a cream, pessary or vaginal tablet or ring containing oestrogen is prescribed to replace oestrogen levels in the genital area. If there are other menopausal symptoms that require treatment, oestrogen is delivered in a more generalised form via an oral tablet or skin patch.

Vaginal moisturisers and lubricants may also be given but these are usually not as effective as oestrogen. Antibiotics are not needed in the treatment of atrophic vaginitis.

# Menopause

**Menopause is an important health milestone in the life of a woman. It is a natural event characterised by the permanent cessation of menses due to the loss of function of the ovaries.**

**Most women breeze through this lifestage with little or no issues while some have bothersome symptoms that require medical assistance.**

## **How do we diagnose menopause?**

Natural menopause is defined by the permanent cessation of menstruation for 12 consecutive months. The diagnosis is retrospective and laboratory tests are only required to exclude other medical reasons that may mimic menopause symptoms. Conditions that may mimic the symptoms of menopause include thyroid problems, tumours, certain medications etc.

## **What is the average age for natural menopause?**

In Asian countries, the average age is between 45 and 50 years.

## **What are the factors that can affect the age of natural menopause?**

Genes are important in determining the age of menopause. Smoking has been shown to bring forward the age of menopause by about 2.5 years.

Chemotherapy and surgery involving the pelvic organs can also cause one to reach menopause at an earlier age.



Smoking brings forward the age of menopause.

## Symptoms

### Sleep

It is known that progression through the menopause transition is associated with sleep disturbances. However, there appears to be a strong association with hot flushes. In fact, after correcting for hot flushes, there seems to be no effect of menopause transition on sleep.

Other factors that can affect sleep include depressed mood, anxiety, joint pain, backache, stress, caffeine intake. Hence, the management of problems of sleep includes sleep hygiene and addressing some of the other potential causes that can affect sleep.

### Hot Flushes

The usual experiences of hot flushes are short-lived, lasting between 5 to 10 minutes each episode. Anyone experiencing 'hot flushes' of more than 30 minutes at one stretch should seek medical advice to exclude other medical conditions.

Hot flushes can start about two years before the final menstrual period and peak about a year after the final menstrual period.

### Mood

It is common for women to blame menopause for their mood swings. However, in large community studies, there appears to be no association. In a group of women with previous history of depression or life stressors, menopause can trigger depression. Sleep disturbances can also serve as a trigger for mood changes during the menopause transition.

## Management

### Lifestyle Modifications

#### Sleep Hygiene

Improving sleep hygiene often can reduce the disturbances in sleep during menopause transition. This would include avoiding stimulants like excessive caffeine, creating a conducive sleeping environment by setting aside the bedroom only for sleep and not other activities like watching the TV, playing games on smartphones or tablets.



Improve on sleep hygiene for better sleep during menopause transition.

Regularise sleep by getting to bed at the same time everyday. Avoid exercise near bedtime as it can delay the time needed to get to bed.

### Exercise

Exercise is important in improving health and in reducing many chronic diseases like diabetes mellitus and hypertension. Maintenance of muscle strength can also reduce the risk of falls and hence fractures as well as reduce the likelihood of body aches which are commonly experienced in Asian women.

Maintenance of a healthy body weight may also reduce the incidence of hot flushes as there will be less body fat to insulate the body.

### Active Social Life

Maintaining an active social life by connecting with friends can improve mood and provide a source of support during this change in the stage of life where many new challenges may surface.

It has also been shown that women who are socially active have less chance of getting dementia.

### Stress Management

While it may be near-impossible to avoid stress in the modern society, techniques to reduce stress in life, such as mind-body therapies, yoga, tai-chi, meditation, etc can reduce the effect of stress on the mind and hence the body.

### Medical Treatment

Hormone therapy remains the most effective treatment for hot flushes. However, the benefits must be weighed against risks of breast cancer, heart attack and strokes for individuals. Bio-identical hormones have been touted as 'natural' and 'safe'. However, there is no current evidence that it is safer than approved hormone therapies.

### Non-hormonal Therapies

Anti-depressants and some other medications have been used in women where hormone therapy is contraindicated with some limited success. Phytoestrogens have inconsistent results with potential for

causing the inner lining of the uterus to thicken in one long-term study over five years.

For black cohosh, in a review, there appears to be no conclusive evidence in the efficacy. Evening Primrose has also not been shown to be effective. As for Vitamin E, there is limited data to support its use in menopause and in some studies, it could potentially cause more severe flu symptoms.

### Take Stock of Your Life

The aim for women reaching menopause would be to maximise her quality of life. These include:

1. **Know your risks.** Find out from your family members and determine if there are certain diseases that are more common in your family.
2. **Prevention of illness through appropriate vaccines.** E.g. Flu vaccine or herpes zoster vaccines.
3. **Reduction of risk of chronic diseases** like hypertension, diabetes mellitus, hyperlipidaemia and osteoporosis through healthy eating and exercise.

4. **Early detection** of chronic diseases and cancer through regular screening.  
(See table below)

### Screening Guidelines for Singapore Women

	Age	40-44	45-49	50-54	60-64	65-69	70-74	>75
<b>Hypertension</b>		Every 2 years if DBP below 85 mmHg and SBP below 130 mmHg Yearly if DBP 85-89 mmHg or SBP of 130-139 mmHg						
<b>Fasting Lipids</b>		Fasting lipids once every 3 years or more frequently when indicated						
<b>Obesity</b>		Assess Body Mass Index and waist circumference yearly						
<b>Diabetes Mellitus</b>		Fasting Glucose every 3 years						
<b>Visual Acuity</b>		Snellen Chart						
<b>Colorectal Cancer</b>		Annual Faecal Occult Blood Test, or flexible sigmoidoscopy 5 yearly or colonoscopy once every 10 years						
<b>Renal Disease</b>		Opportunistic screening with urine dipstick						
<b>Cervical Cancer</b>		Pap smear once every 3 years in women who have ever had sexual intercourse Yearly for HIV positive woman						
<b>Breast Cancer Asymptomatic</b>		Inform women of risk vs benefits. If screening desired, do annual Mammogram		All women to undergo Mammogram once every 2 years				
<b>On HRT</b>		From commencement of HRT till 5 years after stopping. Follow screening intervals of other women.						
<b>Osteoporosis</b>		Bone mineral density measurement. Earlier if other risk factors exist or high risk or moderate risk with risk factors on OSTA. Not indicated in premenopausal women without risk factors.						
<b>Hepatitis B</b>		To do a baseline screen if never done before						

*Adapted from Ministry of Health, Singapore - Clinical Practice Guidelines for Health Screening 2003 and Clinical Guidelines for Cancer Screening Feb 2010.*

Menopause is an important health milestone for women to reassess their health. A healthy lifestyle is the cornerstone for maintaining the health and quality of life of menopausal women.

# Services available at SingHealth Institutions

## **KK Women's and Children's Hospital**

### **Urogynaecology Centre**

Women with urinary tract infections, overactive bladders, and urinary or faecal incontinence often alter their lifestyle believing these are a part of the ageing process.

The KK Urogynaecology Centre is the first one-stop centre in Asia, providing unparalleled services for the investigation, diagnosis and treatment of urinary tract disorders and pelvic floor dysfunctions. The centre serves an average of 10,000 patients every year.

### **Range of Services**

KK Urogynaecology Centre provides comprehensive consultation, diagnostic testing and treatment for our patients with the following conditions:

- Urinary incontinence (involuntary leakage of urine)
- Overactive bladder (overwhelming urge to urinate/passing urine too frequently)
- Voiding dysfunction (difficulty in passing urine)
- Recurrent urinary tract infections (Bacterial infection of bladder and urethra)
- Pelvic organ prolapse (sensation of displaced pelvic organs or lump protruding out of vagina)
- Other urinary symptoms e.g. bed wetting, haematuria (blood in urine), dysuria (pain when passing urine) etc.



## Diagnostic Services

Equipped with sophisticated equipment to help the accurate diagnosis of urogynaecological problems, KK Urogynaecology Centre offers the following diagnostic tests:

- Urinalysis
- Erect Stress Test
- Urodynamic Studies
- Ultrasound Scan
- PAP Smear

## Urogynaecology Conditions & Treatment

The female pelvic anatomy, for which the reproductive organs are in close proximity with the urinary and lower gastro-intestinal tract, is predisposed to urinary incontinence and pelvic organ prolapse.

### Urinary Dysfunction

- Stress Urinary Incontinence (SUI)
- Urge Incontinence
- Overflow Incontinence
- True Incontinence
- Other Types of Incontinences
- Urinary Tract Infection (UTI)
- Voiding Disorders in Women
- Painful Bladder Syndrome (PBS)
- Haematuria

## Pelvic Organ Prolapse

- Prolapse Definition & Types
- Prolapse Causes
- Prolapse: Symptoms & Diagnosis
- Prevention Measures
- Pelvic Floor Exercise
- Non-Surgical Treatments
- Surgical Treatments

## Urogynaecology Research Unit

Our Urogynaecology Department and Centre place significant emphasis on research and education. We share our expertise and experience in female incontinence and prolapse conditions with our medical peers in Singapore and overseas.

### Senior Consultant

Adj Assoc Prof William Han How Chuan  
(Head)

## KKIVF Centre

In 1983, KK Women's and Children's Hospital produced Asia's first in-vitro fertilisation (IVF) baby. Today, the KKIVF Centre (KKIVF) is one of Singapore's largest infertility centres and offers a wide range of testing, diagnostic and treatment procedures. KKIVF believes in utilising the least invasive treatment for the best possible outcome for

each individual patient, provided with personal care and at a competitive cost.

The KKIVF Centre has helped many people, both locals and foreigners, experiencing various infertility problems and these include:

- a. Couples with reproductive problems
  - Unexplained infertility
  - Genetic problems
  - Recurrent pregnancy loss
  - Sexual dysfunction
- b. Women with reproductive problems
  - Ovulatory dysfunction
  - Polycystic ovary syndrome (PCOS)
  - Ovarian cysts
  - Blocked fallopian tubes
  - Endometriosis
  - Fibroids
  - Previous tubal ligation/sterilisation
  - Uterine abnormalities
- c. Men with reproductive problems
  - Low sperm count
  - Absence of sperms (azoospermia)
  - Previous vasectomy
  - Sperm storage prior to cancer treatment
  - Sperm storage for other reasons

## **Assisted Reproductive Techniques (ART) Services**

- a. In-Vitro Fertilisation (IVF)
- b. Intra-Cytoplasmic Sperm Injection (ICSI)
- c. Superovulation & Intrauterine Insemination (SO-IUI)
- d. Embryo & Sperm Cryopreservation
- e. Donor Sperm/Egg/Embryo Programmes
- f. Blastocyst Culture  
Involves extending the culture of the embryos for three more days with a separate medium. It mimics more closely the natural stage of the embryo (i.e. blastocyst stage) during implantation. This programme aims to help patients who have many eggs and yet cannot conceive to increase their chances of implantation and hence achieve pregnancy. KKIVF has started this programme selectively on suitable patients.
- g. In-Vitro Maturation of Oocytes (IVM)  
As the term IVM implies, in this treatment, immature oocytes are retrieved from the ovary and are matured in the laboratory. Once they mature, IVF or ICSI is then performed to assist in fertilising these oocytes.

#### h. Laser Assisted Hatching

Involves breaching the outer layer of an embryo by piercing a hole to facilitate its hatching out and implantation. The hatching process can be impaired by the increased thickness of the outer layer and advanced age of the woman. This programme aims to increase the chances of implantation for the older woman.

#### Other Clinical Services

In addition to ARTs, we also emphasise a one-stop fertility management concept. With a group of well-trained experts incorporating *ARTs, endocrinology therapy and advanced endoscopic reproductive surgical techniques*, we aim to provide a holistic approach to help increase your chance of having a healthy baby!

#### Senior Consultants

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Assoc Prof Chan Kok Yen Jerry

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Dr Veronique Viardot-Foucault

#### Associate Consultants

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#### Menopause Service

Menopause is the final menstrual period and permanent end of fertility. A woman is said to have completed her menstruation when she has not menstruated for 12 consecutive months, or when both ovaries are surgically removed or damaged. Just like puberty, menopause is a natural biological process that a woman's body undergoes.

Although menopause is not an illness, hormonal changes can result in unpleasant physical and emotional symptoms for some women. Do not hesitate to seek treatment if you are having severe symptoms. Many treatments are available, from lifestyle adjustments to hormone therapy.

**Our services:**

- Consultation on menopause
- Lipid profile
- Mammography
- Pap smear screening
- Pelvic ultrasound
- Bone mass density measurement

**Senior Consultant**

Dr Khong Chit Chong

**Consultant**

Dr Rukshini Puvanendran

**Family Physicians**

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# Singapore General Hospital

## Department of Obstetrics & Gynaecology

Established in 1986, the Department of Obstetrics & Gynaecology at SGH is a comprehensive clinical department that provides investigative, treatment and emergency services for a whole range of obstetric and gynaecological conditions.

Set within a general hospital setting and always in close collaboration with the speciality centres, our patient-centric model of care delivery has made us a referral centre for tertiary care of complex gynaecological conditions and high-risk obstetrics cases.

Our multidisciplinary team of experienced clinicians and specialist nurses ensure that all our patients' needs are addressed, providing our patients and their families with the support they need during their period of illness and recovery.

For the health professional, our department has established itself as a centre for clinical education, training and research.

Against a backdrop of rapid developments, our department strives



to provide our patients with the best care by keeping abreast of the fast changing panorama of women's health.

## Gynaecological Oncology

The Gynaecological Oncology Service offers diagnosis and treatment of cancerous and pre-cancerous conditions. The spectrum of surgery offered includes minimally invasive and robotic, open and major exenterative techniques collaborating in a multidisciplinary setting with other oncology specialties. Our own Clinical Nurse Specialist offers support to all women with suspected gynaecological malignancy throughout their time in the Unit.

Cervical screening and colposcopy assessment and treatment of cervical abnormalities are all offered including the recent introduction of HPV testing to aid optimum management.

## **Maternal-Fetal Medicine**

The Maternal-Fetal section comprises a multidisciplinary team of doctors focusing on high-risk obstetrics and includes joint clinics with the endocrinologists and cardiologists. The patient receives comprehensive care throughout pregnancy with labour being managed by the same team, led by a labour ward Lead Clinician.

First Trimester Screening for Down's syndrome is performed by an experienced team of sonographers accredited by the Fetal Medicine Foundation (United Kingdom). Level II fetal anomaly scans are carried out in conjunction with prenatal invasive testing. There is also a one-stop scan clinic for monitoring multiple pregnancies.

## **Minimally Invasive & Robotic Surgery**

The Minimally Invasive and Robotic Surgery Service was established in 2013 to provide state-of-the-art surgical techniques for all classes of patients and for a multitude of benign gynaecological conditions. It aims to offer MIS surgery for complex benign pathology where open surgery would generally be offered.

Minimally Invasive Surgery offers patients a shorter hospital stay, less post-

operative pain, faster return to normal activities and improved cosmetic results. Robotics offers further enhancements to this by offering the surgeon the best operative view, most precise instruments and most ergonomic approach to keyhole surgery.

## **Reproductive Medicine**

The Centre for Assisted Reproduction or CARE manages both male and female patients with fertility problems. Our team of experienced IVF accredited specialists, nurses, embryologists and sonographers work together to offer state-of-the-art medicine in patients' fertility and IVF journey. Individualised treatment is tailored according to the couple's medical conditions and needs. Counselling services are also available as part of the holistic approach to patient care.

Fertility preservation for semen, oocytes, embryo and ovarian tissue storage services are also available for patients about to embark on treatment that may affect their fertility potential (e.g. cancer patients going for chemotherapy).

## **Urogynaecology**

Our urogynaecology section offers one-stop evaluation and treatment of women with urinary incontinence

as well as pelvic floor dysfunction, including urogenital prolapse and post-hysterectomy vaginal vault prolapse. Our multidisciplinary clinic is a special service that looks after women with complex pelvic floor problems and is jointly run by our urogynaecologists, urologists and colorectal surgeons.

Therapeutic options include non-surgical management with the use of support devices such as pessaries for prolapse, pelvic floor training and medical therapy for bladder disorders. Surgical management may be considered in some women with severe symptoms or when conservative treatment is ineffective.

### **Ultrasound Services**

Our team of experienced sonographers provides a comprehensive service and perform more than 25,000 scans per year. Established in 1987, the team has expanded their service of performing 'routine' gynaecological scans to performing specialised scans in the Centre for Assisted Reproduction (CARE), Prenatal Diagnostic Centre (PDC) and the Early Pregnancy Unit (EPU).

The EPU facilitates prompt access for patients with first trimester complications and aims to centralise and streamline assessment, diagnosis, management and counselling of patients with conditions such as miscarriages and ectopic pregnancies.

### **Senior Consultants**

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