

For Prostate Cancer Patients



# A MEDICAL GUIDEBOOK



## ABOUT THIS BOOKLET

Produced by Singapore Cancer Society, this booklet is designed to help men who have recently been diagnosed with prostate cancer. It provides concise information about what prostate cancer is and its related matters. The diagnosis and tests to study the development of the cancer, treatment options and how to cope with it are also discussed in this booklet.

We hope that this booklet will help patients, caregivers, spouses and family members to understand more about prostate cancer so the condition can be better managed to an eventual successful recovery.

### About Singapore Cancer Society



The Singapore Cancer Society (SCS) is a community based voluntary welfare organisation dedicated to minimising the impact of cancer through public education, screening, patient services, financial assistance, research and advocacy.

As a self-funded charity, SCS is dependent on public donations to provide quality services to cancer patients, their families and the community at large.

SCS was established in 1964, registered as a society in 1984 and was accorded IPC (Institution of a Public Character) status as a charity in 1995 by the Ministry of Health.

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#### Singapore Cancer Society

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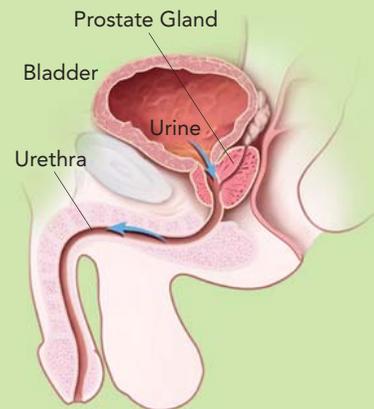
# What You Need to Know About Prostate Cancer

## What is the Prostate Gland?

The prostate is a small gland in the pelvis found only in men. It is about the size of a walnut.

## Where is it Located?

It is located between the penis and the bladder and surrounds the urethra (the tube that carries urine from the bladder to the penis).



## What is the Function of the Prostate?

The main function of the prostate is the production of semen. It produces a thick white fluid that mixes with sperm produced by the testicles, to create semen. The male sex hormone, testosterone, is required for the prostate's growth and function.

## What is Prostate Cancer?

Prostate cancer is the uncontrolled spread or malignant growth of abnormal cells of the prostate. It generally affects men over 50 and can be found rarely in younger men.

In most of the cases, prostate cancer is a slow growing cancer and may stay undiagnosed because it rarely causes any symptoms. However in some men the cancer may become aggressive

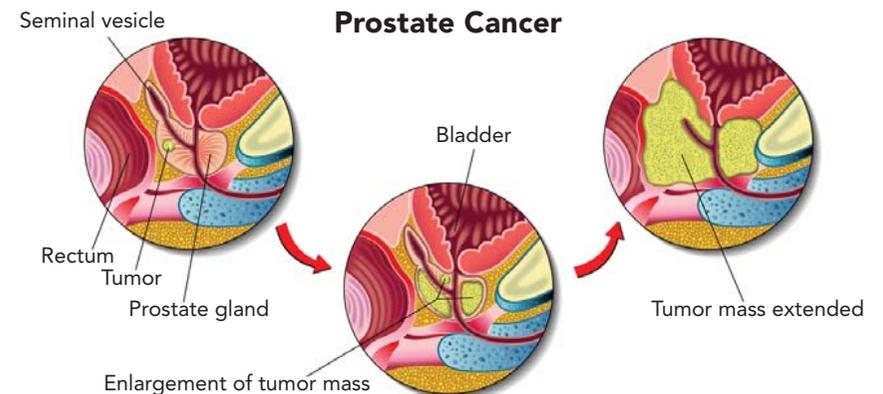
and grow and spread more quickly to other parts of the body. The bones are a common place for prostate cancer to spread, causing bone pain.

## How Common is Prostate Cancer in Singapore?

Prostate cancer is the 3<sup>rd</sup> most common cancer diagnosed in Singapore men. A total of 3,705 new cases of prostate cancer were diagnosed from 2010-2014, contributing 12.4% of newly diagnosed male cancer cases during that period.

In terms of mortality, prostate cancer has the 6<sup>th</sup> highest mortality rate in Singapore men. Approximately 148 men die of prostate cancer each year in Singapore, contributing 5.3% of all male cancer deaths.

*(Source: Singapore Cancer Registry, Annual Registry Report, Trends in Cancer Incidence in Singapore, 2010-2014)*





### What are the Risk Factors for Developing Prostate Cancer?

- **Age** – Age is the strongest risk factor for prostate cancer. The chance of getting diagnosed with prostate cancer increases after age 50.
- **Hereditary / Genetic** – It may run through some families due to inherited genes.

- **Lifestyle and Diet** – A healthy diet and lifestyle is important in protecting against prostate cancer. Eating red meat / high fat dairy products may increase the risk of prostate cancer.
- **Obesity** – Having a higher body mass index increases the chances of being diagnosed with advanced prostate cancer.

### What are the Signs and Symptoms of Prostate Cancer?

Early prostate cancer usually causes no symptoms.

Many men over 50 years old have urinary symptoms such as:

- Frequent urination especially at night
- Inability / Difficulty to pass urine
- Difficulty holding back urine flow
- Weak urine flow or a flow that stops and starts

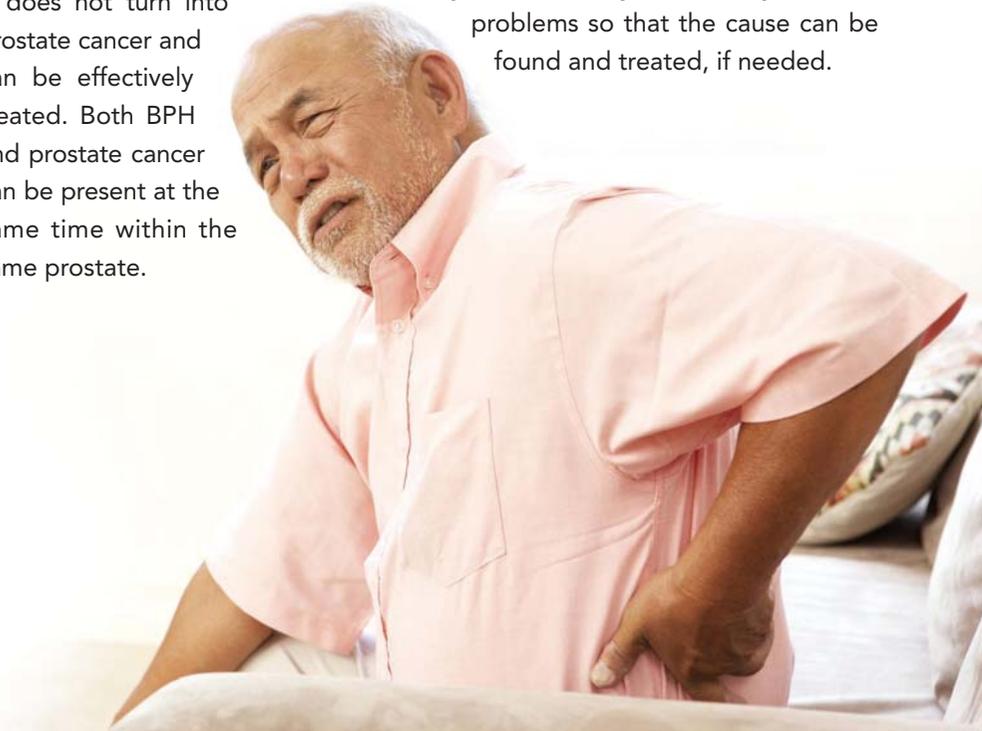
However, these symptoms are more often caused by benign prostatic hyperplasia (BPH) rather than prostate cancer. BPH is a non-cancerous enlargement of the prostate gland as men get older.

It does not turn into prostate cancer and can be effectively treated. Both BPH and prostate cancer can be present at the same time within the same prostate.

Advanced prostate cancers can cause the symptoms listed above plus:

- Pain / burning while urinating
- Painful ejaculation
- Blood in the urine or semen (hematuria)
- Persistent pain in the lower back, hips, or upper thighs
- Weakness or numbness in the legs or feet, or even loss of bladder or bowel control from cancer pressing on the spinal cord.

It is important to note that having these symptoms does not necessarily mean that you have prostate cancer, as other diseases may also cause these symptoms. However, you should tell your doctor if you have any of these problems so that the cause can be found and treated, if needed.





# Diagnosing Prostate Cancer

## How is Prostate Cancer Diagnosed?

Early prostate cancers usually do not cause symptoms, but may be found during screening or while undergoing assessment for urinary symptoms related to BPH. More advanced cancers are sometimes first found because of symptoms caused to the patient.

Diagnostic tests include PSA (Prostate Specific Antigen) blood test, Digital Rectal Examination (DRE), Transrectal Ultrasound Guided Biopsy (TRUS biopsy); MRI, CT and Bone scans.

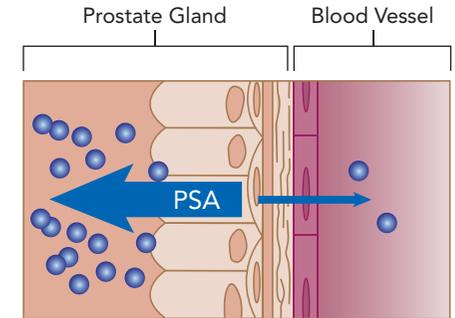
## Prostate Specific Antigen (PSA) blood test

This test is to measure the level of a protein in your blood called PSA. PSA is a protein produced by normal prostate cells as well as prostate cancer cells. Generally, a high level of PSA in the blood may indicate the presence of prostate cancer (as illustrated in the diagram on the right) and is used to trigger other tests to diagnose prostate cancer in men.

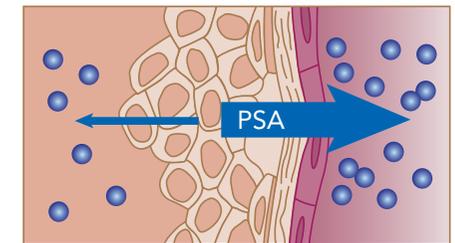
The PSA test is also an effective way to monitor the progression of prostate cancer after the patient has been diagnosed or had treatment. The test can also provide doctors with an indication of the extent of the disease when combining with the information of cancer grade and stage.

However, PSA is not a specific test for prostate cancer. A high PSA reading does not always mean you have prostate cancer. Besides prostate cancer, the PSA level can be affected by a number of conditions such as an enlarged prostate (BPH), inflammation or an infection of the prostate, and advancing age.

Prostate cancer cannot be diagnosed based on an elevated PSA level alone. An abnormal PSA value will prompt your doctor to discuss a prostate biopsy to look for prostate cancer cells in your prostate.



**Normal** Cells in the prostate are healthy and organized in a tight pattern. Only a small amount of PSA leaks out of the prostate and gets into the bloodstream.



**With Prostate Cancer** Now the cells are disorganised and the layers between the prostate and blood vessel become disrupted. More PSA can leak into the blood vessel as a result.

On the other hand, a normal PSA level does not completely rule out prostate cancer. Some cancers don't produce much PSA; and can grow despite a low PSA level. For this reason, a digital rectal examination is usually done with a PSA test, to increase the chance of picking up these low-PSA tumours.

### What Does My Test Result Mean?

A PSA test alone can't tell you whether you have prostate cancer, because other conditions can affect your PSA level. All men have some PSA in their blood, and the level of PSA naturally rises as they get older. The prostate gland gets larger with age, and may produce more PSA.

There is no specific normal or abnormal level of PSA in the blood. 'Normal' PSA levels usually measured in nanograms per milliliter of blood (ng/ml) are:

For a man aged 50 to 59 –  
up to 3ng/ml.

For a man aged 60 to 69 –  
up to 4ng/ml.

For a man aged 70 or over –  
up to 5ng/ml.

This is just a guide – the actual figure depends on the laboratory performing the PSA test. If a man has a PSA level above the normal range, doctors would often recommend a prostate biopsy to determine whether prostate cancer is present.

In general, however, the higher a man's PSA level, the more likely it is that he has prostate cancer. Moreover, an upward trend in a man's PSA level over time may also be a sign of prostate

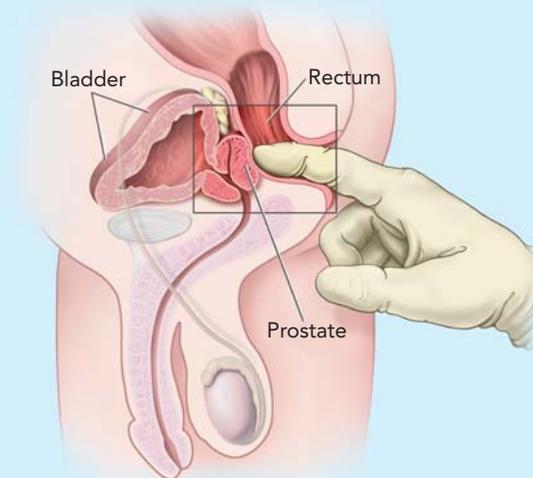
cancer. For example, a man with a PSA level between 4-10ng/ml has a 25% risk of being diagnosed with prostate cancer. If the PSA is higher than 10, the risk increases and can be as high as 67%.<sup>1</sup>

*Ref 1: M.B. Gretzer, A.W. Partin / European Urology Supplements 1 (2002) 21-27.*

### Digital Rectal Examination (DRE)

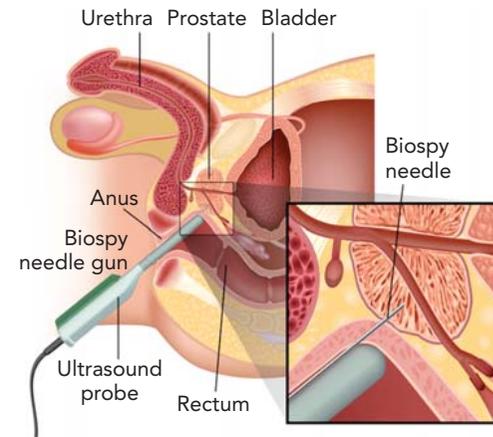
DRE is an examination in which the doctor feels the prostate gland through the wall of the back passage (rectum). The doctor inserts a lubricated gloved finger into the rectum.

It is done to check for abnormalities like enlargement of prostate gland, growths and tumors in the prostate gland. It can also detect growths or tumors in the rectum.



### Prostate Biopsy

At present, the main way of diagnosing prostate cancer is by taking a biopsy (tissue sample of the prostate) for microscopic examination by a pathologist.



The prostate biopsy is most commonly done under the guidance of transrectal ultrasound (TRUS) under local anesthesia. An ultrasound probe is inserted into the rectum to view a man's prostate and surrounding tissues, and the doctor will insert a needle to take tissue samples from the prostate. While prostate tumors cannot be seen by ultrasound, the ultrasound guides the doctor to take multiple biopsies to systematically sample different areas of the prostate.

If cancer has been detected, the pathology report will include the details of

how many samples contain cancer, how much cancer is detected in each sample and the Gleason score (which is a measure of the aggressiveness of the cancer).

If the prostate biopsy is negative for cancer, there is a 10-35%<sup>2</sup> risk of a false negative, i.e., there is cancer in the prostate that is undetected by the initial biopsy. Patients should continue to be followed up and their doctors may recommend additional biopsies.

*Ref 2: European Urology 58 (2010) 851-864.*

### Risk of Prostate Biopsies

Prostate biopsies can sometimes be complicated by bleeding in the urine, semen or from the rectum. Occasionally, patients may experience difficulty passing urine after the biopsy. Rarely, patients may have fever from infection. These infections can be serious, and require hospital admission for antibiotics.

For men with a previous negative TRUS prostate biopsy and continued suspicion for prostate cancer, the options available are to repeat the biopsy either by TRUS biopsy again, or by a transperineal saturation biopsy.

A transperineal biopsy is done under regional or general anesthesia in an operating room. The biopsy needles

are inserted through the perineum (the skin between the scrotum and the anus), into the prostate to obtain the tissue sample. An ultrasound probe is placed in the rectum, and this guides the placement of the biopsy needles. As the procedure is done under anesthesia, an increased number of biopsies can be taken to more thoroughly sample the prostate, reducing the chance of missing an underlying significant cancer.

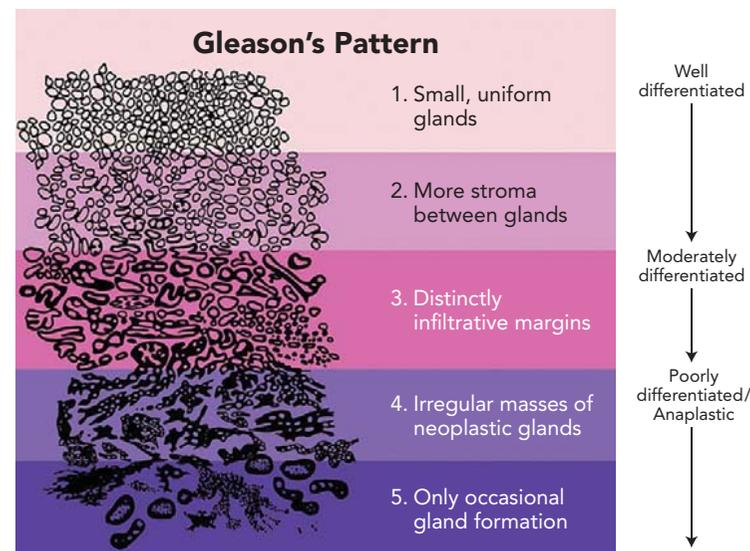
As the transperineal route avoids going through the rectum, there is a near zero rate of infection as opposed to the approximately 3% rate of infection associated with the TRUS biopsy. With the increasing prevalence of bacteria that are resistant to multiple antibiotics, these post biopsy infections can sometimes be severe, and rarely, can even be life threatening. Another advantage of the transperineal route is that it allows sampling of the front parts of the prostate, which can harbour large tumours, but is difficult to reach by the transrectal route. This allows for a more thorough sampling of the prostate, and reduces the chance of missing a significant cancer.

Potential side effects from a transperineal saturation biopsy include bruising over the perineum, and blood in the urine, which usually resolve without any intervention after a couple of days. Patients may have difficulty passing urine after the procedure because of a temporary swelling of the prostate, requiring a urinary catheter for a few days until the swelling resolves.

### Understanding the Biopsy Report and Gleason Score

Pathologists will look at the biopsy samples under the microscope.

Cancer cells are graded depending on how alike they are to normal cells. So, if your cancer cells look like very normal prostate cells, your cancer is low grade. If they are very unlike them, your cancer is a high grade.



Generally, low grade cancers tend to grow more slowly and are less likely to spread than high grade cancers.

The most common grading system in use is the Gleason score. A pathologist looks at the pattern (arrangement) of the cancer cells and grades them from 3 to 5. Grade 1 and 2 are thought of as normal prostate cells. Grades 3 – 5 are thought of as cancer cells, with grade 5 being the most abnormal.

There may be more than one grade of cancer in the multiple tissues samples.

The pathologist works out an overall Gleason score by adding together the two most common Gleason grades.

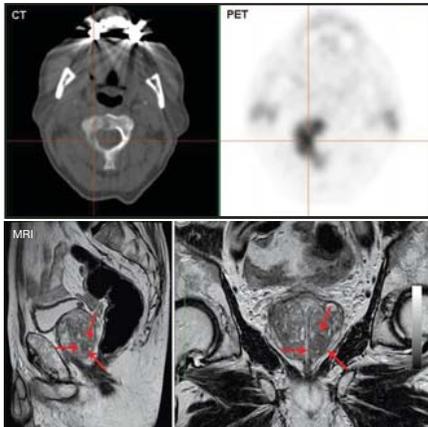
For example, if the most common grade of the samples is grade 3 and the second most common is grade 4 then the overall Gleason score is  $3 + 4 = 7$ .

All prostate cancer cases will have a Gleason score between 6 and 10. If the Gleason score is higher, it indicates a more aggressive form of cancer and is more likely to spread.

## Tests Done After Prostate Cancer Diagnosis

If prostate cancer has been diagnosed, further tests may be performed to determine whether the cancer is within the prostate or has spread beyond it.

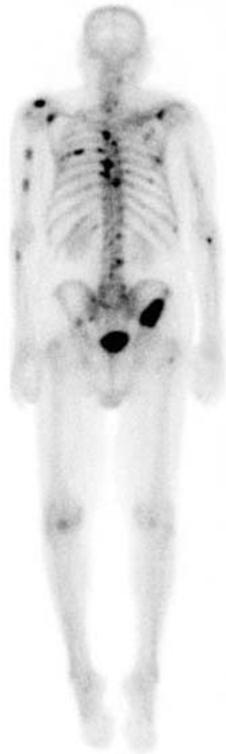
- **CT scan** – A computerized tomography (CT) scan helps the specialists to detect if the cancer has spread beyond the prostate to the surrounding tissues like the lymph nodes or nearby bones. It uses x-rays to take pictures of the body from different angles.



- **MRI scan** – The magnetic resonance imaging (MRI) scan uses magnets rather than x-rays. It will create an image of the prostate and other tissues to find out if the cancer has spread beyond the prostate.

- **Bone scan** – A bone scan will help to know if the cancer has spread outside the prostate to the bone. A small amount of safe radioactive dye is injected into a vein of the patient's arm and then the scan is taken after 2-3 hours to pick up the "hot spots", where the radioactive dye has been collected. These hot spots can show if the cancer has spread to the bone.

The patient may be asked to have x-rays of the hot spots to check if they are definitely cancer. If it's still not clear an MRI scan may follow.



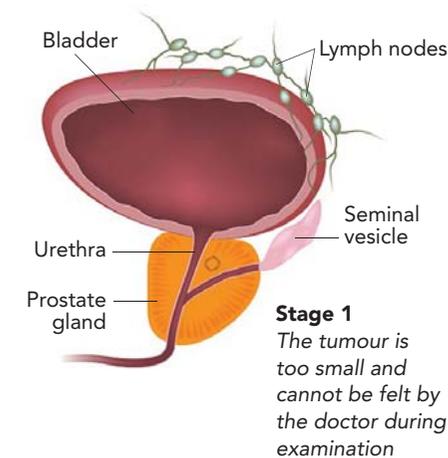
## Staging

It is the process of determining the extent of the cancer spread. TNM classification of malignant tumors is a cancer staging system to describe how far a person's cancer has spread.

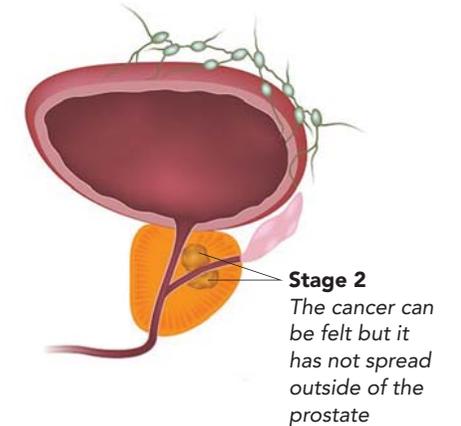
### T stage (tumor stage)

The T stage describes the size of the original (primary) tumor and whether it has invaded the nearby tissues.

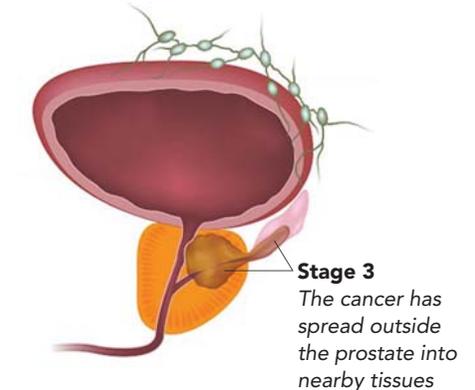
- **T1 Localised Prostate Cancer:** The tumors are too small to be seen on scans or during the examination of the prostate. They can be only discovered from a prostate resection or biopsy and seen under the microscope.



- **T2 Localised Prostate Cancer:** The tumors are completely inside the prostate gland and can be felt during the digital rectal examination.

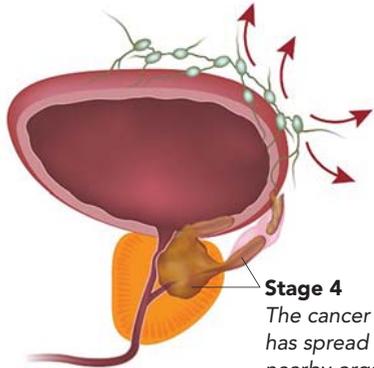


- **T3 Locally Advanced Prostate Cancer:** The tumor has broken through the capsule or covering of the prostate gland or it has spread into the seminal vesicles.



### T4 Locally Advanced Prostate Cancer:

The tumor has spread to the nearby organs such as rectum, bladder or the muscles of the pelvic wall.



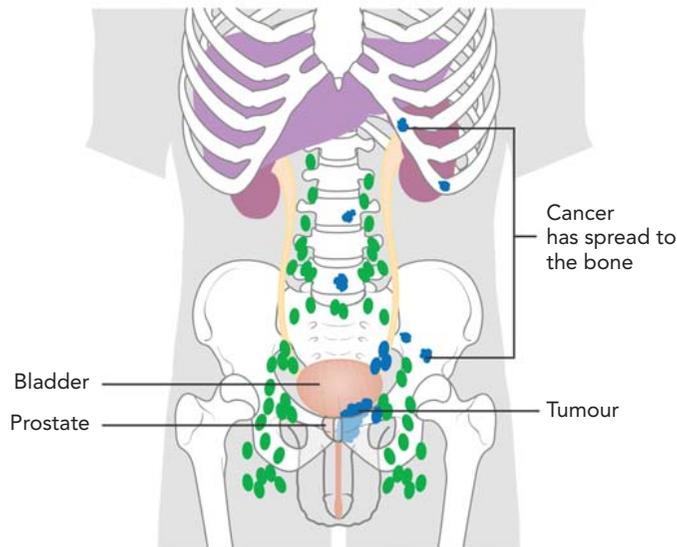
**Stage 4**  
The cancer has spread into nearby organs such as the bladder or the muscles of the pelvic wall

### N Stage (nodal stage)

N stage describes the nearby (regional) lymph nodes involved. Lymph nodes are the tiny bean shaped organs that help fight the infection. They are part of the immune system and are found throughout the body.

Lymph nodes in the pelvic region near the prostate are called the regional lymph nodes. Prostate cancer that has spread to the lymph nodes is advanced.

- NX** The lymph nodes cannot be measured.
- N0** There are no cancer cells present in the lymph nodes close to the prostate.
- N1** There are cancer cells present in the lymph nodes.



Bladder

Prostate

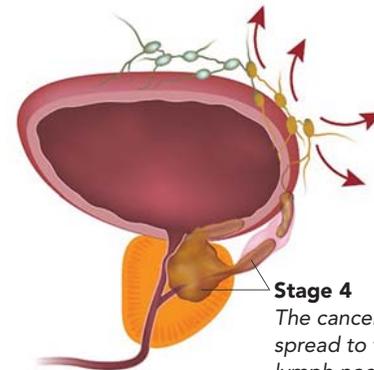
Cancer has spread to the bone

Tumour

### M stage (Metastasis)

M stage describes the spread of cancer to distant parts of the body (metastasised) such as bones. Cancer that has spread to other parts of the body is called metastatic prostate cancer.

- M0** No cancer has spread outside the pelvis.
- N0** Cancer has spread to the lymph nodes outside the pelvis or to the bones or other organs.



**Stage 4**  
The cancer has spread to the lymph nodes outside the pelvis or to the bones or other organs

Doctors may also divide prostate cancers into the following 3 groups.

### Localised prostate cancer

It is the cancer which is completely contained within the prostate gland. Doctors also call it as early prostate cancer.

### Localised advanced prostate cancer

It is the cancer that has broken through the outer covering (capsule) of the prostate gland. It might have just spread outside the prostate into the seminal vesicles, lymph nodes, neck of the bladder or rectum.

### Metastatic prostate cancer

Metastatic prostate cancer is cancer that has spread from the prostate to the other parts of the body. Prostate cancer most commonly spreads to lymph nodes outside of the pelvis or bones. It can spread to other organs though.

### Table of Prostate Cancer Staging

Stage	Description	T (Tumor stage)	N (Nodal stage)	M (Metastasis stage)
<b>I</b>	In Stage I, the cancer is located only in the prostate. A DRE or imaging tests might not be able to locate it. The cancer in this stage is likely to have a slower growth rate.	T1a, T1b, or T1c	N0	M0
		T2a	N0	M0
		Any T1 or T2a	N0	M0
<b>IIA</b>	A diagnosis would be able to detect a small or large tumour in Stage II. The cancer is only located within the prostate gland but the cells tend to be more abnormal and grow quickly.	T1a, T1b, or T1c	N0	M0
		T2a	N0	M0
		T2b	N0	M0
<b>IIB</b>		T2c	N0	M0
		Any T1 or T2	N0	M0
<b>III</b>	Tissues located beyond the outer layer of the prostate would contain the spread of the cancer. It may have spread to the seminal vesicles.	T3a or T3b	N0	M0
<b>IV</b>	At this stage, the cancer has spread to other parts of the body, such as the bladder, rectum, bone, liver, lungs or lymph nodes.	T4	N0	M0
		Any T	N1	M0
		Any T	Any N	M1

### Risk Grouping

Risk Grouping is a process of separating patients with similar prognoses by combining TNM stage, Gleason score and PSA level in order to help decision making regarding treatment.

Risk Profile	Criteria
Low	T1c-T2a Gleason score $\leq 6$ PSA $\leq 10$ ng/mL
Intermediate	T2b-T2c Gleason score 7 PSA 10-20 ng/mL
High	T3a Gleason score $\geq 8$ PSA $>20$ ng/mL



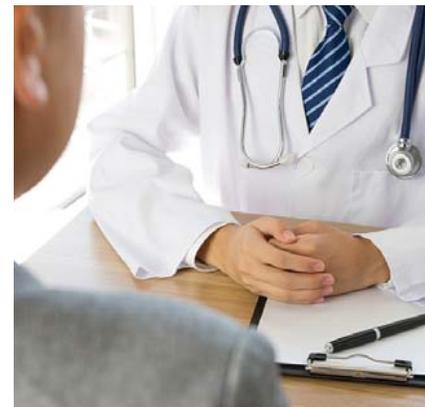
# Treating Localised Prostate Cancer

The treatment choices for a cancer that is localised would be different from those for locally advanced or advanced prostate cancer. If you have localised prostate cancer, you generally have three main choices of treatment. These are: Active Surveillance (ie, to do nothing for now and just have check-ups), to have surgery, or to have a form of radiotherapy.

It is not known which type of treatment is the best for localised prostate cancer. Therefore, when you decide which treatment to have, it is important to see doctors who are specialists in the different types of treatment.

## Deciding On the Best Treatments for Yourself

When you meet up with your doctor to discuss on the treatment options, be sure to clarify on any questions or doubts you may have. Ask everything you wish to know before agreeing to the proposed treatment to undergo. The common treatments include active surveillance, surgery, or some form of radiotherapy. You will need to understand the pros and cons of each treatment. Understand the possible side effects that can result from the different treatments administered. This information will be explained by your doctor.



There are many factors to consider. The first is the level of risk your prostate cancer poses to you. This is determined by your doctor by studying how far the cancer has spread (the staging) and how fast it is likely to grow (the grade)

and your PSA level. Age, life expectancy (the number of years you are expected to live), current health condition, expected quality of life after treatments, and importantly, your individual preferences will influence this decision.

Before you decide on the treatment to take, you can seek a second opinion from another specialist for a second consultation. Do find out as much information as you need to help you make your decision.

The list of treatment options are explained below. A summary of their individual advantages and disadvantages is also listed for your reference.

## Active Surveillance

Many prostate cancers are found after diagnosis and staging, to be at low risk of causing prostate cancer death or harm, especially in older men.

For this group of patients, doctors may recommend active surveillance as they can be observed carefully, not requiring immediate treatment. If there are signs that the cancer progresses to a higher risk disease, immediate treatment may then be offered.

This potentially spares patients with prostate cancer that may never cause harm to them, the potential side effects of therapy. Studies have shown that

in carefully selected men on active surveillance, the chance of prostate cancer related death can be as low as less than 1% after 10 years of follow up.

Active surveillance involves regular check-ups and visits to the doctor. The tests may include PSA blood tests, MRI scans of the prostate, and repeat prostate biopsies. This monitoring allows doctors to intervene early, if the need arises.

If these tests show the cancer is growing or becoming more aggressive, the doctor may then recommend treatment with the intention to cure the patient. Over time, approximately one third of men on active surveillance will be found to have higher risk disease and undergo active treatment with surgery or radiotherapy.

If you choose active surveillance, it's important to be compliant to these follow-up tests so that in the event the



untreated cancer is more dangerous than originally assessed, this can be detected earlier before it spreads outside the prostate area. This is to maintain the window of opportunity for cure and not compromise on cancer survival.

#### Advantage

There are no treatment related side effects

#### Disadvantage

There is a small risk of cancer spreading outside the prostate, lowering the chance of cure

You may suffer anxiety from the knowledge of having untreated cancer

The need for repeated regular examinations and biopsies

## Watchful Waiting

This is a different way of monitoring prostate cancer that is not causing any symptoms or problems. It involves monitoring the prostate cancer over a long term to avoid treatment, intervening only if symptoms develop.

It is generally indicated for men who have a short life expectancy because of advanced age or from other severe medical problems, and whose cancer is unlikely to cause any problems during their lifetime.

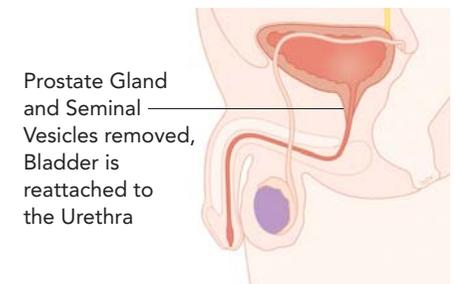
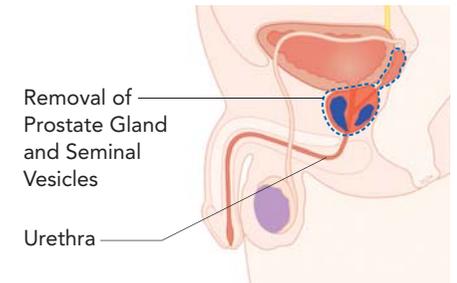
It involves fewer tests than active surveillance and treatment generally starts only when a patient gets symptoms. Treatment in this instance is intended to treat the symptoms and will not cure the patient from the cancer.

## Surgery (Radical Prostatectomy)

Radical prostatectomy is the surgical procedure to completely remove the prostate and seminal vesicles. Radical Prostatectomy is recommended when the cancer is confined to the prostate gland. The aim is to remove the cancer entirely.

Sometimes your surgeon may take out some lymph nodes near your prostate to see if the cancer has spread in a procedure called pelvic lymph-adenectomy. Lymph nodes are small, round, or

bean-shaped masses of tissue found throughout your body. They are part of your immune system – more specifically the lymphatic system – that helps your body fight infection and disease. As lymphatic fluid travels through the body, immune cells (called lymphocytes) in the lymph nodes trap bacteria, viruses, and other potentially harmful substances and destroy them to help prevent their spread. They also keep fluid balance in check.



If the lymph nodes contain cancer, then the surgeon may recommend further treatment because the cancer is no longer localised. There is still some uncertainty on whether extensive removal of lymph nodes will provide better cure rates. Removal of lymph

nodes take extra time during the surgery and is associated with increased complications such as injury to the large blood vessel to the legs, post-operative leg swelling or deep venous thrombosis. The decision on whether the lymph nodes need to be removed is based on the risk that the prostate cancer may have spread to them. Most international guidelines recommend removal of lymph nodes if radical prostatectomy is undertaken for selected moderate and all high risk prostate cancer.

After removal of the prostate, your urethra will be joined to your bladder. While this joint heals, you will need to install a catheter. This thin tube runs from inside your bladder (where it is held in place by a balloon), inside the penis to the outside of your body where it connects to a bag. This bag is used to collect your urine, which can be emptied into a toilet. Men normally need a catheter for 7-10 days after surgery. Occasionally they may need it up to three weeks.

After the catheter is removed, it is normal to have some urinary incontinence (loss of urine control). This usually lasts for a short time but can be ongoing. Men will need to wear absorptive pads until this resolves. Most men will recover

continence, and only 1-2% will continue to have severe incontinence 1 year after radical prostatectomy.

When you get home from hospital, you will be encouraged to resume walking and light activities, but should refrain from strenuous activity and heavy lifting for the first six weeks.

Loss of erection is a common post-operative change after radical prostatectomy. The chance of this will depend on the extent of the cancer and the nerves which control erection (which lie closely on either side of the prostate) that needs to be removed with the prostate.

If the surgeon judges that these nerves can be safely left in place without compromising cancer cure, this is called a nerve-sparing operation. In such a case, your chance of returning to pre-operation potency is greater. Age is also a factor affecting the return of erections. Older men are less likely to achieve their pre-operation erection strength.

Following a radical prostatectomy, men may notice that their penis is 1-2cm shorter. While the reason for this has not been firmly established, it is likely that damage to nerves running close to the prostate or interruption to blood supply is the cause.

In addition, cutting the tubes that bring sperm to the prostate is part of the surgery. This will lead to the inability to father children. This is usually not an issue for older men with prostate cancer, but may be an important factor

in younger men who have not completed their families.

The side effects occurring after surgery improve over time and there are treatments available to help in your condition.

Advantage	Disadvantage
The lymph nodes can be removed if needed (to check if the cancer has spread)	Require general anesthesia and risks of postoperative complications such as bleeding, wound pain and infections
Removal of the prostate allows detailed examination, with accurate determination of the cancer grade, stage and volume	Hospital stay post-surgery required
With the cancer confined to the prostate gland, surgery offers a higher chance of eliminating the cancer and allowing patients to remain cancer-free	Possible erectile dysfunction (difficulty in getting and keeping an erection)
Removal of the prostate results in rapid fall of PSA to very low levels – facilitates easier cancer follow-ups	Urinary incontinence (problems controlling urine)
Decreases chance of problem of bleeding and urine obstruction if the cancer returns	

There are a few approaches to Radical Prostatectomy as detailed below.

### Open Surgery

This is the traditional approach to doing a prostatectomy. The surgeon operates through a single long incision to remove the prostate and nearby tissues. The incision is usually in the lower belly, from the belly button down to the pubic bone, but rarely may be in the perineum between anus and the scrotum.

### Minimally Invasive Radical Prostatectomy

#### Laparoscopic surgery

The surgeon makes several small incisions in the belly. Laparoscope (a light viewing instrument) is inserted into one

of them. The surgeon then uses special instruments to reach and remove the prostate through other incisions.

#### Robotic assisted laparoscopic surgery

With this minimally invasive approach, telescopic instruments are inserted into six small incisions (about 1cm) in the abdomen. The surgeon controls the movement of the robotic instruments remotely. Robotic arms are used to translate the surgeon's hand motions into finer and precise action. The robot also provides a magnified view of the operation field. You are positioned in a steep 'head down' position for a robot assisted laparoscopic prostatectomy and this can occasionally cause anesthetic complications.



Robotic assisted radical prostatectomy offers several advantages. Although experts do not agree as to whether robotic or open surgery is better, the majority of prostate cancer surgeries in Singapore are being done with the laparoscopic / robotic approach. The post-operative goals for treating prostate cancer are the same regardless of whether the operation is done with an open or laparoscopic approach.

#### Advantages to Robotic Assisted Laparoscopic Surgery

##### Less Scarring

The first advantage to robotic surgery is that it's an application of advance technology and is minimally invasive. Instead of having a 15cm incision to the skin, patients have a series of small incisions the size of a handiplast.



##### Shorter Hospital Stay

With smaller incisions, the post-operative pain is significantly less, which means a shorter hospital stay and a quicker return to normal activities. After the robotic prostatectomy, patients typically stay in hospital for 1 to 2 nights.



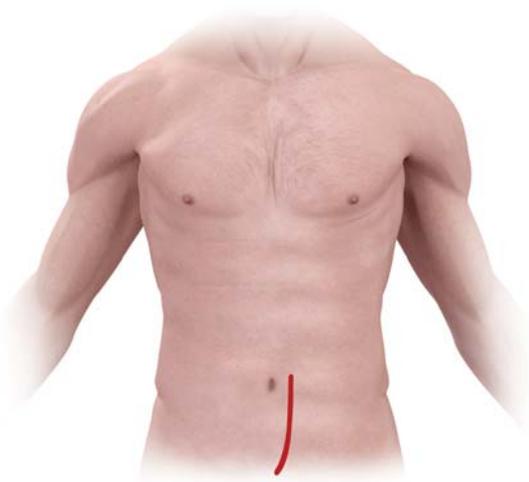
Comparatively, after the open prostatectomy patients spend at least 5-7 nights in the hospital primarily for pain control, nausea and difficulty getting out of bed and getting back to an activity level that would be appropriate for them to be discharged home.

##### Less Drugs and Blood Loss

Patients' need for postoperative pain medicine is also greatly reduced after the robotic approach compared to open surgery.



(continue on page 26)



Open Prostatectomy Incision



Robotic Prostatectomy Incisions

## Advantages to Robotic Assisted Laparoscopic Surgery

*(continue from page 25)*

Another advantage to robotic surgery is less blood loss during the surgery. During traditional open surgery, it is not uncommon for patients to lose between 600cc and 1000cc of blood during the course of surgery. This may lead to a need for blood transfusions (with its attendant risks) among these patients.

During robotic/laparoscopic prostatectomy, blood loss is usually 200cc or less, which is very minimal and has a negligible risk of needing a transfusion.

### Postoperative Catheterization

The third advantage of robotic surgery over open surgery is a reduction in the required postoperative catheterization time. After open surgery, foley catheters are left to drain the urine for usually two or more weeks. After the robotic approach, the catheter typically remains in place for 7 to 10 days. The reason for this difference is unclear but may be related to the increased precision and visibility the robotic approach offers and also maybe that a running anastomosis (bringing the bladder, neck and urethral sphincter back together) may be done in a water-tight fashion compared to the open approach.

### Erectile Function

The fourth advantage of robotic prostatectomy is the (at least theoretically) improved ability to preserve the nerves that control erection. During an open prostatectomy, the nerves that provide erection are hidden behind the prostate. The approach taken using the surgical robot enters the abdomen and the robotic arms are positioned behind the prostate with the nerves directly in front of the robotic/laparoscopic camera. In this way, the nerves may be better preserved primarily because the anatomy can be seen more clearly compared to open surgery. In addition, the decreased blood loss of the robotic approach and visual magnification provided improves the intra-operative visibility. This facilitates attempting to preserve these delicate nerve structures.

## Radiation Therapy

Radiation therapy (also known as Radiotherapy) uses high-energy rays or particles to kill cancer cells.

Radiotherapy may cure prostate cancer if the cancer is confined to the prostate (or nearby) at the time of treatment. It is also suitable for some men with locally advanced prostate cancer and for older men with other health problems that could make the risk of surgery greater.

The results of radiotherapy are very good and most men live free of disease for 10 years or more. As with surgery, many men enjoy long periods of life free from cancer after they have radiotherapy.

There are two main types of radiotherapy for prostate cancer: External Beam Radiotherapy (EBRT), and Brachytherapy. In EBRT, beams of radiation are focused on the prostate gland from a machine outside the body. In Brachytherapy (also known as internal radiation therapy), the radioactive materials are placed in the prostate gland close to the cancer cells. Depending on the type of cancer, you may be given just one form of radiation therapy or even a combination of both.

### External Beam Radiotherapy (EBRT)

This is a common form of treatment for prostate cancer. EBRT focuses radiation from a machine (a 'linear accelerator') onto the pelvis region, where the prostate cancer is located.



To reduce the risk of side effects, the radiation beams are aimed as accurately as possible, to hit the carefully outlined target and reduce exposure of the nearby organs (e.g. bladder, rectum) to radiation. It is important to note that you are not 'radioactive' during or after your course of EBRT. Most men can go about their normal daily activities while receiving EBRT.

Before treatment starts, you will be required to undergo a simulation CT scan of the pelvis to find the exact

location of your prostate gland and obtain data that will be used to produce your radiotherapy treatment plan. During this procedure, the radiation team will make some ink marks on your skin that they will use later as a guide to focus the radiation on.

Treatment is usually delivered 5 days a week in an outpatient setting for 7 to 8 weeks. However, some special EBRT treatment techniques require less than 10 sessions. Each treatment is much like getting an x-ray. The radiation is stronger than that used for an x-ray, but the procedure is painless.



Men with more advanced prostate cancer may require hormone therapy in combination with radiotherapy as part of the treatment. Hormone therapy may be used before, during or after radiotherapy. Hormone therapy utilises drugs designed to remove or minimise the effect of testosterone on the body. This type of 'combined modality therapy' has been shown to improve cure rates and survival in patients with medium and high-risk prostate cancer.

### Side Effects of EBRT

Radiotherapy (unlike chemotherapy) can only cause side effects at the area where the beams are being directed (i.e. in the pelvic area). Modern radiotherapy uses newer techniques that are better at avoiding the bowel and bladder, which means that the risks and severity of side effects are much lower. Nausea and vomiting rarely occur. There are short-term side effects that might appear during or soon after your treatment, and long-term side effects that can appear months or years after you have completed your treatment.

**Short-term side effects:** These include bowel changes (e.g. diarrhea), skin reactions (e.g. skin becoming red, darkened or dry), bladder problems (e.g. burning when urinating) and tiredness. Many of these symptoms can be helped with medications and they usually resolve within a few weeks of completing radiotherapy.

**Long-term side effects:** A small number of men may find the bladder problems and bowel changes persisting even after their radiotherapy has finished for some time. Radiation can affect the bladder, leading to a condition called radiation cystitis. This may result in side effects such as blood in the urine and frequent, urgent painful urination. Similarly, radiation can affect the rectum

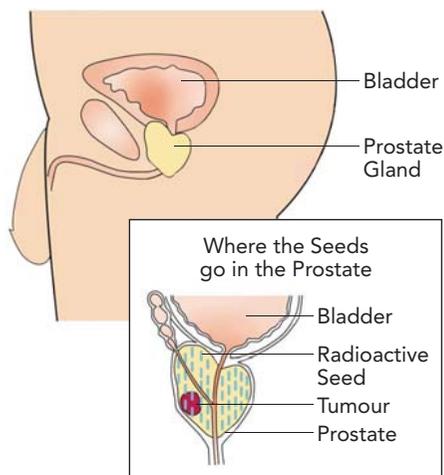
and cause radiation proctitis. This may result in diarrhea, sometimes with blood in the stool, and faecal incontinence. Some men may find themselves slowly developing problems with erections

(erectile dysfunction) after they have radiotherapy. Infertility is another possible long-term side effect. There is also a small risk of secondary cancers in the long term after radiotherapy.

Advantage	Disadvantage
Most suitable to target and eliminate cancer that has spread outside the prostate region	Problems such as erectile dysfunction and infertility may occur as long-term side effects
If you're unfit for general anaesthesia, radiotherapy is a possible option	Radiation may affect the bladder resulting in blood in the urine and/or frequent painful urination
Radiotherapy is a painless procedure, sessions last from 10 to 20 minutes	Radiation may affect the rectum resulting in diarrhea, blood in the stool and faecal incontinence
No stay in hospital required	

## Brachytherapy

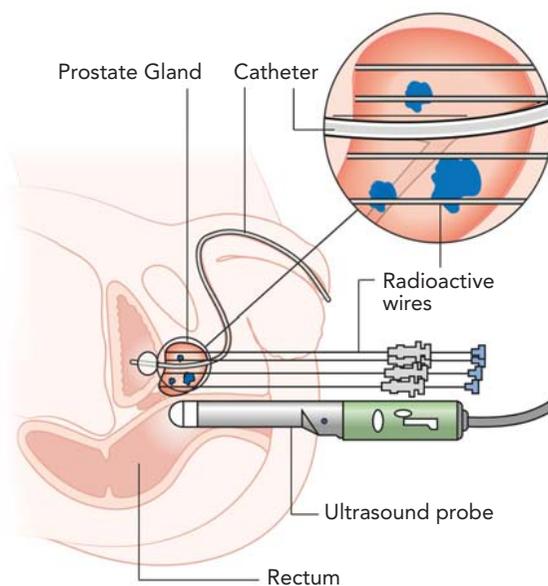
Brachytherapy is an internal radiotherapy treatment that involves placing radioactive materials in the prostate. These radioactive materials can be left in place either temporarily or permanently. Brachytherapy is an option for men with localised prostate cancer. It can be given alone or in combination with EBRT. For brachytherapy, the radiation may be delivered at various intensities, e.g. low dose or high dose rate.



### High dose rate brachytherapy

In high dose rate (HDR) brachytherapy, tiny radioactive seeds or pellets (about the size of a grain of rice) are delivered to the prostate via thin tubes, for a set period of time. The seeds and the tubes

are withdrawn from the body at the end of the procedure. HDR brachytherapy delivers radiation at a much greater level of intensity; hence the treatments are quicker and effective.



### Advantage

Shorter treatment period compared to external beam radiotherapy

Brachytherapy focuses radiation only on the prostate gland, and thus lower chance of radiation injury to the bladder and rectum

Does not impact a patient's erectile function as much in comparison to other treatments

### Disadvantage

Brachytherapy may not be suitable for men with larger prostates or who have undergone prostate surgery before

Feelings of discomfort when radioactive seeds/rods are inserted into the prostate

Urinary problems and bladder irritation may occur

### Low dose rate seed brachytherapy

Low dose rate (LDR) brachytherapy involves implanting the radioactive seeds into the prostate. It delivers radiation with a low level of intensity, whereby the seeds stay in the prostate and release low levels of radiation slowly for a few months. The radiation in the seeds will gradually fade away, and the harmless seeds are left in the prostate gland permanently. Babies and small children should not be held on the lap for two months after LDR brachytherapy because of the risk of radiation exposure.

### Side Effects of Brachytherapy

Possible side effects include pain when urinating, poor urine flow, inability to urinate, bladder irritation (needing repeated visits to the toilet) and infertility.

### Hormonal Therapy

Some doctors have used hormone therapy instead of watchful waiting or active surveillance in men with early (stage I or II) prostate cancer who do not want or who are unfit for surgery or radiation. Studies have not found that these men live any longer than those who don't get any treatment until the cancer progresses or symptoms develop. Thus, these men are exposed to the side effects of hormonal therapy (see next chapter) earlier in the course of their disease, without proven benefit in terms of survival. **Because of this, hormone treatment is not usually advised for early stage prostate cancer.**



# Understanding Locally Advanced Prostate Cancer

Locally advanced prostate cancer has spread outside the gland itself, but is still confined within the immediate prostate region. It may be in the fat immediately adjacent to the prostate or may have spread into the seminal vesicles (tumour stage T3) or other surrounding organs such as the bladder or rectum (tumour stage T4).

Locally advanced prostate cancer is still potentially curable, but carries a high risk of recurrence after treatment by surgery or radiotherapy. This means that more than one type of treatment may be needed to control that risk, and there is a higher chance of complications.

Men who have enlarged lymph nodes on staging scans or are found to have cancer cells in pelvic lymph nodes taken out during radical prostatectomy, are at high risk of having disease that has spread to distant parts of the body.

## Treating Locally Advanced Prostate Cancer

Locally advanced prostate cancer can be treated in a number of ways. The best treatment for you will depend on a number of different factors so it isn't possible to say which treatment is best overall. Sometimes treatment for locally advanced prostate cancer aims to get rid

of prostate cancer completely. If it is not possible to get rid of the cancer, the treatment aims to control it and to stop it growing. Your doctor will decide which treatment or combination of treatments is suitable for you. This will be decided with you once you have your test results.

Your doctor will consider factors such as:

- The stage of your cancer – whether it has spread just outside the prostate gland, how far outside, or whether it may have spread to other parts of your body.
- The grade of your cancer (how fast the cancer cells are dividing and their appearance under the microscope)
- Your PSA level
- If you have urinary symptoms or not
- Your general health

## Cancer Control Treatments for Locally Advanced Prostate Cancer

### External beam radiotherapy with a period of androgen deprivation therapy

This is the most proven treatment for locally advanced prostate cancer.

By the time it has been diagnosed, locally advanced prostate cancer has often already sent tiny cancer cells to other parts of the body, such as the bones. These micro-metastases are usually not picked up by scans or tests. To give



the best chance of curing the cancer so that it never returns, successful treatment usually requires a combination of both EBRT and androgen deprivation therapy (ADT). ADT (see page 38 on *Metastatic Prostate Cancer*) removes male hormones which are necessary for prostate tissue to grow and seems to be more effective when combined with radiotherapy.

ADT may be administered before radiotherapy (neo-adjuvant), at the same time as radiotherapy (concomitant) and/or immediately after radiotherapy (adjuvant). This therapy may last as long as two to three years in total. ADT and EBRT combine to cause the death of cancer cells both within and outside the prostate. Combined therapy using EBRT and hormone therapy gives the highest chance of curing locally advanced prostate cancer.

Most patients treated with EBRT and hormone therapy are happy with their results. Mild side effects are common, but usually do not significantly affect the patient's quality of life. Almost all patients are able to continue normal activities such as working, driving and exercising during and after radiotherapy. Side effects during EBRT can include tiredness, the need to pass urine or bowel motions more frequently, and the feeling of 'when you've got to go, you've



got to go'. These symptoms usually appear towards the end of EBRT and are generally mild and easily treated. They usually resolve within a month or so of completing EBRT. Longer-term effects can occur, but again are generally mild. They include erectile dysfunction, and changes in bowel or bladder function. These can usually be treated, so it is important to report them to your doctor. Leakage of urine is another uncommon side effect.

Long-term ADT may have continuing side effects (see page 38 on *Metastatic Prostate Cancer*). It is important that your general practitioner (GP) monitor you for possible side effects. These can include erectile dysfunction, a drop in sex drive, shrinking of sex organs (testes and penis), enlarged breasts (gynaecomastia), tiredness, hot flushes, thinning of the bones which can lead

to fractures, weight gain, diabetes, high blood pressure and cholesterol, and a reduction in muscle mass and strength. Some men experience mood swings and notice changes in mental function. Over the short periods when ADT is used in combination with EBRT for locally advanced disease, the effects are not as noticeable as when ADT and EBRT are used continuously for metastatic prostate cancer. However some effects may be noticed in the short term.

Dietary changes, vitamin D and calcium supplements can reduce the risk of bone fractures. A regular exercise program, particularly strength exercises, can reduce muscle loss and tiredness and may help with mood effects as well. We cover these and other measures you and your GP can take to reduce these side effects on pages 44–45.

### **Androgen deprivation (hormone) therapy alone**

Androgen deprivation therapy (ADT) aims to reduce levels of testosterone in the body, thus preventing prostate cells from growing and multiplying as well as killing cancer cells. ADT is recommended when cancer cells are likely to have spread beyond the prostate region. Specialists agree that two to three years of ADT should be used when combined with radiotherapy in locally advanced

prostate cancer (neo-adjuvant or adjuvant therapy). However, not all specialists agree on the best time to start long-term ADT for patients with locally advanced prostate cancer, who are not being treated for cure.

It is not known whether there is a benefit in starting ADT before there is evidence of metastases, that is, if the cancer has not spread beyond the prostate region to other parts of the body. At least one study suggests that ADT in men with positive pelvic lymph nodes improves cancer control and survival after surgery in men with locally advanced disease. However ADT alone is not as effective in prolonging survival as ADT combined with EBRT. As explained above, long-term ADT has considerable side effects that may affect your quality of life. These are important considerations in deciding if or when to go on ADT.

### **Surgery with or without radiation and androgen deprivation therapy**

The standard approach when trying to cure patients with locally advanced prostate cancer is a combination of EBRT and hormone therapy. There is however, increasing evidence that for selected men with locally advanced prostate cancer, radical prostatectomy as initial treatment is a viable alternative.

Some men will be found to have localised disease after radical prostatectomy, and will fare well without additional radiation therapy. The majority will be found to have high risk features in the pathological examination of the prostatectomy specimen, and may be recommended to undergo additional radiation and hormonal therapy to further control the disease.

This approach gives good control of local symptoms and prevents future complications from the prostate. Some men will be found to have less extensive disease than suggested on staging investigations, and be spared radiation and hormonal therapy.

Not all men with locally advanced prostate cancer will be suitable for this approach, and patient selection for this approach must be done on a case by case basis, preferably at a multidisciplinary tumour board\*.

### Hormonal therapy

Hormonal therapy is administered to a patient to block the male hormone testosterone (also known as an androgen), from interacting with prostate cancer cells, thereby causing the cancer to shrink. This form of therapy is most often used in patients with metastatic cancer and is discussed in detail in the following chapter. Men with locally

advanced prostate cancer without evidence of metastatic spread are also potential candidates for this form of therapy.

### Early Versus Delayed Treatment

For men who need (or will eventually need) hormone therapy, such as men whose PSA levels are rising after surgery or radiation therapy; or men with advanced prostate cancer with no symptoms and have not developed metastatic cancer, it's not always clear when it is best to start hormone treatment. Some doctors think that hormone therapy works better if it's started as soon as possible, even if a man feels well and is not having any symptoms. Some studies have shown that hormone treatment may slow the disease down and perhaps even help men live longer.

But not all doctors agree with this approach. Some are waiting for more evidence of benefit. They feel that because of the side effects of hormone therapy and the chance that the cancer could become resistant to therapy sooner, and that it is not clear that earlier treatment will prolong the patient's survival, treatment shouldn't be started until a man has symptoms from the cancer. Studies looking at this issue are now under way.

## Treatment for Prostate Cancer Found to be Locally Advanced After Initial Treatment with Radical Prostatectomy

### External beam radiotherapy after surgery ("adjuvant radiotherapy" or "salvage radiotherapy")

There are several important things that a pathologist will look for in tissue removed at surgery for prostate cancer. These important high-risk features indicate whether the cancer may come back in the area around the 'surgical bed' where the prostate used to be. The pathologist will determine the following:

- *Has all of the cancer been taken out?*  
If the cancer goes up to the cut edges of the tissue removed by the surgeon, there are cancer cells left in the body and the cancer can return.
- *Has the cancer gone out of the prostate into the fat?*  
If it extends into the fat (known as extracapsular spread) it can come back, even if it looks as though the surgeon removed all of the cancer.
- *Has the cancer gone into the seminal vesicles?*  
The seminal vesicles are glands that sit on top of the prostate. If the cancer

is in the seminal vesicles then it can come back in the surgical bed, even if it looks as though the surgeon removed all of the cancer.

Radiotherapy immediately after surgery (adjuvant radiotherapy) has been shown to reduce the chance of biochemical recurrences (PSA rising after surgery), reduce prostate cancer spreading to other parts of the body (such as bones), but has not conclusively been shown to improve survival. On the other hand, adjuvant radiotherapy can impact recovery of continence after radical prostatectomy. The timing of adjuvant radiotherapy may be deferred while waiting for recovery of continence after the radical prostatectomy. Not all patients with high risk features on radical prostatectomy will progress to cancer recurrence, nor do all patients with high risk features benefit from adjuvant radiotherapy. Another option is to wait for early signs of cancer recurrence with PSA monitoring, then start radiotherapy (this is called salvage radiotherapy).

Patients with any of the above situations should be discussed at a multidisciplinary tumour board\*.

\*A multidisciplinary tumour board is a meeting where urologists, medical and radiation oncologists discuss management of difficult cancer cases.



# Metastatic Prostate Cancer

Metastatic prostate cancer occurs when groups of cancer cells leave the prostate region (the original tumor location) and spread out into other parts of the body. These deposits of cancer cells outside the prostate region are known as metastases. The most common site of metastases are the nearby tissues and lymph nodes in the pelvis, and the bones. Other potential sites of metastases includes other organs like the liver and lungs.

## Signs & Symptoms

Symptoms of metastatic prostate cancer vary depending on the site, and amount of involvement, by metastatic cancer cells. In the early stages or if the metastases are small, there are likely to be no symptoms. In advanced stages, bone pain, back pain, weight loss and unusual tiredness are some symptoms of metastatic prostate cancer. Specific symptoms include:

- Pain in the lower back, upper thighs and hips – from tumour involvement of bones
- Bone fractures after low speed trauma that ordinarily should not cause fractures – from weakening of bones by cancer cells
- Numbness/pin-like feelings in the arms and legs – from cancer spread pressing on the spinal cord/nerves
- Weight loss and/or loss of appetite
- Tiredness and looking pale – from a low blood count because of cancer involvement of the bone marrow which produces red blood cells
- Urinary symptoms – from blockage of the urethra from the prostate cancer



To evaluate further on whether the cancer cells have spread to the lymph nodes, bones or other parts of the body, your doctor will ask you to go for the following tests:

- **PSA Test** – Once prostate cancer is proven, a PSA level above 20ng/ml is associated with higher risk of spread outside of the prostate.
- **X-rays** – May be used to examine areas where pain is reported (such as the bones).
- **CT & MRI Scans** – These scans will show to what extent surrounding tissues outside the prostate are affected as well as other areas in the body (eg, looking for cancer cells that may have spread to the lymph nodes or liver).
- **Bone Scans** – Bone scans are done to look for cancer spread to the bones.

## Treating Metastatic Prostate Cancer

### Hormonal Therapy

Hormonal therapy, also known as androgen deprivation therapy or castration, is administered to a patient to block the male hormone testosterone (also known as androgen), from interacting with prostate cancer cells, thereby causing the cancer to shrink.

Androgens are needed for prostate cells and prostate cancer cells to multiply and continue their survival. Testosterone is produced in the testicles. When hormonal therapy is given, testosterone reproduction will be markedly reduced and all its action in the body tissues will be stopped, causing prostate cancer cells to die away in a process known as apoptosis. Hormonal therapy may control the cancer, often for a number of years, but it is not a cure. Usually, the cancer will change over time into a form that no longer needs testosterone to grow. When the cancer no longer requires testosterone to grow, it is called castrate resistant, and other treatments must be considered.

Hormone therapy will treat all prostate cancer cells, wherever they are in the body. It is generally used for locally

advanced and metastatic prostate cancer. The therapy basically works to

- Reduce the androgen production by the testicles.
- Block androgen action in the body.
- Block the production of androgens throughout the body.

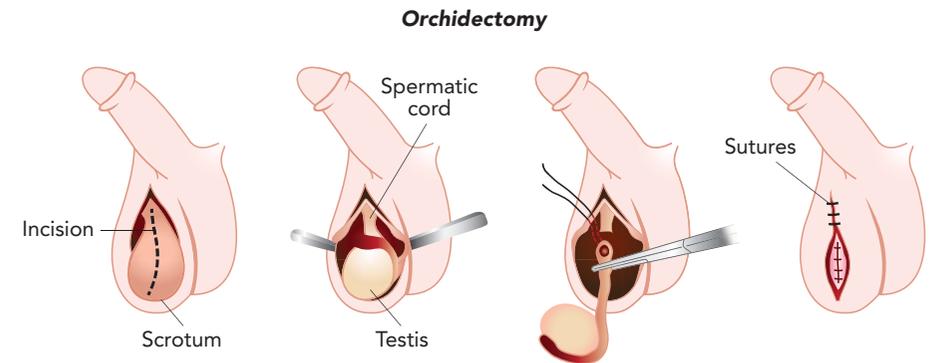
### Types of Hormonal Therapy

There are two main approaches to hormonal therapy – surgical removal of the testes (orchidectomy) or medical castration. Both treatments are equally effective in controlling cancer growth and the side effects are also similar.

#### Orchidectomy

This is a surgery which removes the testicles. It is a procedure performed by a surgeon with the patient under anaesthesia. The procedure occurs by making an incision to remove the testicles, leaving the scrotal sac intact. This is a safe, minor surgery which can be done as a day procedure.

However, as a patient's fertility is affected, men planning for children may need to consider sperm banking where sperm is taken from a patient (before his surgery) to be stored for later use.



The advantages of orchidectomy over medical castration are:

- Patients do not need to have regular injections.
- Compliance to treatment is not an issue.
- The effectiveness is as good as medical castration, but the costs of this one time procedure is much less than regular hormonal treatment.

The drawbacks of orchidectomy are:

- The invasive nature of surgery and its attendant risks such as infections and anaesthetic complications.
- Some men may find the loss of their testis psychologically distressing.

#### LHRH agonists

LHRH agonists are used to stop the production of testosterone. A patient receives the drug through an injection into his abdominal fat or muscle area. They do this by initially stimulating

release of the pituitary hormone called leuteinising hormone (LH) that triggers release of testosterone by the testicles causing 'flare' (see page 42). Testosterone production then drops.

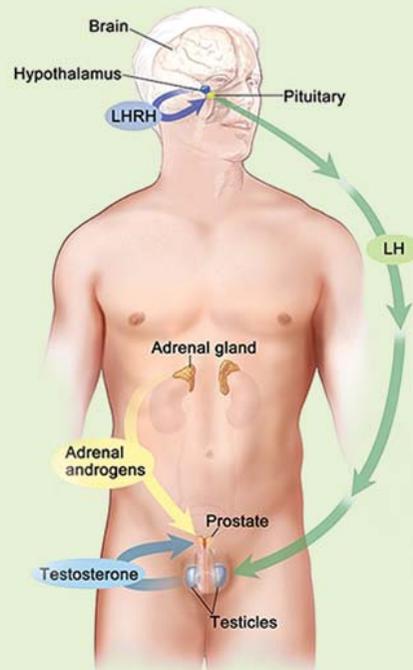
The drug is delivered by injection into the fat or muscle and can be given monthly or every three, or six monthly. The effect is reversible in most patients in that if the medication is stopped, testosterone levels return to normal after some months. Examples of LHRH agonists are goserelin and leuprorelin (Zoladex®, Lucrin® respectively). Because these drugs may not be fully effective in reducing testosterone levels in all men, it is normal to check blood testosterone levels some months after starting the hormone or when they are no longer working. Unless you choose a form of androgen deprivation called intermittent androgen ablation, it is normal to continue this form of androgen deprivation indefinitely.

## FLARE PHENOMENON

One temporary effect of using one of the LHRH agonist is called 'flare'. Specifically, when an LHRH agonist (an agent which causes stimulation) is first started, it can cause a rise in the pituitary hormone LH during the first 5–12 days. The LH rise in turn stimulates the testicles to make testosterone. After prolonged binding of the LHRH agonist to its receptor, it turns off production of the LH and testosterone levels then decrease. The initial surge in testosterone can be seen in a blood test.

Occasionally it briefly stimulates tumour growth (ie in the first month only, before the testosterone levels decline). If there are metastases (tumour deposits) close to important structures such as the spinal cord, this can trigger symptoms such as paralysis, nerve pain, obstruction of urinary flow or increase in bone pain.

Flare can be prevented by using anti-androgens which block the testosterone from getting to tumour DNA and stimulating the cell proliferation. This class of drug (e.g. bicalutamide, also known as Casodex®) is given just before or at the same time as commencing LHRH agonist therapy.



## LHRH antagonists

LHRH antagonists (Degarelix also known as Firmagon®) work like LHRH agonists, but they reduce testosterone levels more quickly and do not cause tumor flare like the LHRH agonists do. They also have the advantage of less cardiovascular related side effects compared to LHRH agonists, and this may be an advantage to patients who are at higher risk of such events.

It is given as a monthly injection under the skin. The most common side effects are problems at the injection site (pain, redness, and swelling). Other side effects are the same as those faced with LHRH agonists.

## Anti-androgens

Anti-androgens (e.g. bicalutamide, also known as Casodex®) are taken in tablet form, and work by blocking the action of testosterone on the cancer cells, without decreasing the testosterone levels in the body. They work best when combined with LHRH Agonist therapy or an orchidectomy to achieve both a halt of testosterone production and action in the body.

If side effects from orchidectomy or LHRH agonist/antagonist are of concern, consideration can be made to take anti-androgens alone to treat metastatic prostate cancer. The anti-androgens have the advantage of less sexual and bone related side effects, as the testosterone levels and function outside of the prostate are not reduced. They do however, carry the risk of liver dysfunction, and liver function must be monitored if anti-androgens are taken. However, they are less effective than standard androgen deprivation therapy with LHRH agonist/antagonist therapy or orchidectomy.

As discussed above, anti-androgens are often taken at the initiation of therapy with LHRH agonists to prevent the flare phenomenon.

## Other androgen-suppressing drugs

Estrogens (female hormones) were once the main alternative to orchidectomy for men with advanced prostate cancer. Because of their possible side effects (including blood clots and breast enlargement), estrogens have been largely replaced by LHRH analogs and anti-androgens. Still, estrogens may be tried if other types of hormone therapy are no longer working.

## Complications Arising from Hormonal Therapy

As male hormones have many functions in the body, depriving androgen can cause side effects. The common side effects may include loss of sex drive, erectile dysfunction, hot flushes, breast enlargement, weight gain, lack of energy and mood swings. Osteoporosis or softening of the bones is a long-term concern.



### Hot flushes

Due to dropping levels of testosterone, hot flushes may occur. You may feel heat sensations building up in your face, neck, chest and back areas. Sweating, nausea and reddening of skin typically accompany hot flushes. Stress, heat and hot liquids are some contributing factors towards causing hot flushes.

A number of drugs can be used to treat hot flushes, including low dose Androcur<sup>®</sup>, progestins, some anti-depressants drugs called SSRIs (selective serotonin reuptake inhibitors), and small doses of oestrogens.



Some alternative treatments reported to be helpful include acupuncture, soy products (probably for their phyto-oestrogen content) and vitamin E, or even drinking an ice cold drink when you feel a hot flush coming on. Most drugs have their own set of side effects and so the benefit of these treatments needs to be balanced against any new side effect they may cause.

### Sexual problems

Sexual problems such as erectile dysfunction and a poor interest in sex (libido) and intimacy may arise. These side effects may affect men and how they feel about themselves including relationships with their spouses.

Erectile dysfunction can be treated in a couple of ways. They include oral medications called PDE-5 inhibitors e.g. Viagra<sup>®</sup>, Cialis<sup>®</sup>; penile injections, vacuum erection devices and insertion of penile implants.

### Bone pain and fractures

Osteoporosis or the thinning of the bones is a direct side effect from hormone therapy treatment. Factors such as age and the timing hormone therapy is administered on a patient can introduce adverse effects. For instance, older men who receive hormone therapy are more likely to sustain a higher number of bone fractures than those who are not on the treatment.

It is recommended to have a bone density scan every one or two years and supplementary vitamin D and Calcium for men on hormone therapy. Other measures include avoiding smoking and reducing intake of tea, coffee and alcohol.

Resistance exercises are also useful for men with bone problems. Muscles on the arms, leg and torso will be worked out against a resistance. They help to lower fatigue levels in men and improve muscular fitness.

*Singapore Cancer Society conducts a weekly resistance exercise programme called the Walnut Warriors Exercise Programme. It is highly recommended for men undergoing hormone therapy treatment. For more information, please call 64999132 or send an email to [supportgroup@singaporecancersociety.org.sg](mailto:supportgroup@singaporecancersociety.org.sg)*

### Anxiety and depression

Men on hormone therapy may be prone to frequent mood changes. Anxiety and depression may settle in and affect you immensely. Coping with them may take the toll on you and affect your day to day life. Research shows that men on hormone therapy treatment are more prone to anxiety and depression than men who undergo other treatments. Memory function may also be affected due to depression and low testosterone levels.



It will be important to identify these problems early and seek a consultation with a specialist who can help provide you with appropriate coping strategies or medical support. It will be also better for you to keep yourself engaged in activities, be they social or recreational as well as regular exercise. They could give a boost to your well-being and how you feel.

### Fatigue

Experiencing fatigue is common with men who undergo hormone therapy. Your muscle loss, mood changes and anaemia might also be contributing factors. Fatigue may cause you to lose interest or lack energy to continue with your normal day to day activities. However, exercise can be a helpful remedy as body muscle mass and fitness can be improved and help you sustain energy for your normal activities.

### Loss of muscle mass

You may find your body muscle mass decreasing and thereby limiting your ability to participate in intensive activities and exercises. These changes can be reduced by doing regular resistance exercises.

### Metabolic changes

As hormone therapy causes metabolic changes of fat and sugar in the body which subsequently increase the risk of cardiovascular disease and diabetes, exercise and careful monitoring of your levels of bad cholesterol (low density lipo-protein cholesterol) and fasting insulin (sugar levels) by your doctor are recommended to minimise these changes.

### Gynaecomastia

Breast development (gynaecomastia) is a possible occurrence in men who receive high doses of bicalutamide (cosudex). The breasts may also experience pain and swelling. Tamoxifen is a drug that controls oestrogen levels and could be a remedy to prevent breast growth. Undergoing radiation before receiving bicalutamide is another option.

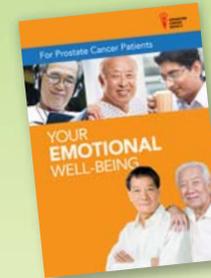
### Combined Chemotherapy and Hormonal Therapy

Chemotherapy for advanced prostate cancer is usually only considered when the prostate cancer no longer responds to hormonal therapy.

Recently, two ground breaking clinical trials have shown that the addition of chemotherapy to hormonal therapy earlier on, when men are newly diagnosed with metastatic prostate cancer, significantly improved survival.

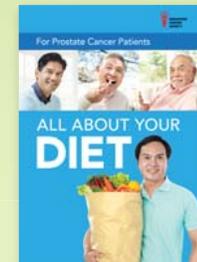
This new development is very promising; however, not all men may be suitable for this combined approach.

For more information on how to cope with the side effects that arise from hormonal therapy treatment as well as other treatments, please refer to the following sections in these booklets by Singapore Cancer Society:



#### For Prostate Cancer Patients – Your Emotional Well-Being

Pg 7: *Dealing With The Side Effects  
From Your Condition and Treatments*



#### For Prostate Cancer Patients – All About Your Diet

Pg 14: *Managing The Side Effects  
From Your Treatment*

## SCS Prostate Cancer Survivorship Programme

The SCS Prostate Cancer Survivorship Programme aims to improve the quality of lives of men who have been diagnosed with prostate cancer (PCa) by making available to them a series of psychosocial, physiological and psychological support. Through this programme, SCS aims to facilitate their transition from an institutional to community based care.

This is to be achieved via the follow programmes and initiatives:



- SCS Walnut Warriors Support Group
- SCS Walnut Warriors Exercise Programme
- Prostate Cancer Awareness Month (PCAM)
- SCS PCa Survivorship Materials
- SCS Patient Ambassador Programme
- SCS PCa Specialist Training Programme
- SCS PCa Nurse Exchange Programme/ Attachment
- SCS PCa Advisory Panel

For more information on the above programmes, please call: **6499 9132**

Email: [supportgroup@singaporecancersociety.org.sg](mailto:supportgroup@singaporecancersociety.org.sg)

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## Publication References

- Localised Prostate Cancer: A Guide for men and their families (by Cancer Council Australia)
- Advanced Prostate Cancer: A Guide For Men and Their Families (by Australian Cancer Network and Australian Prostate Cancer Collaboration)
- Cancer Research UK: [www.cancerresearchuk.org](http://www.cancerresearchuk.org)
- Prostate Cancer UK: [www.prostatecanceruk.org](http://www.prostatecanceruk.org)



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